AMERICAN

# Journal of Mining,

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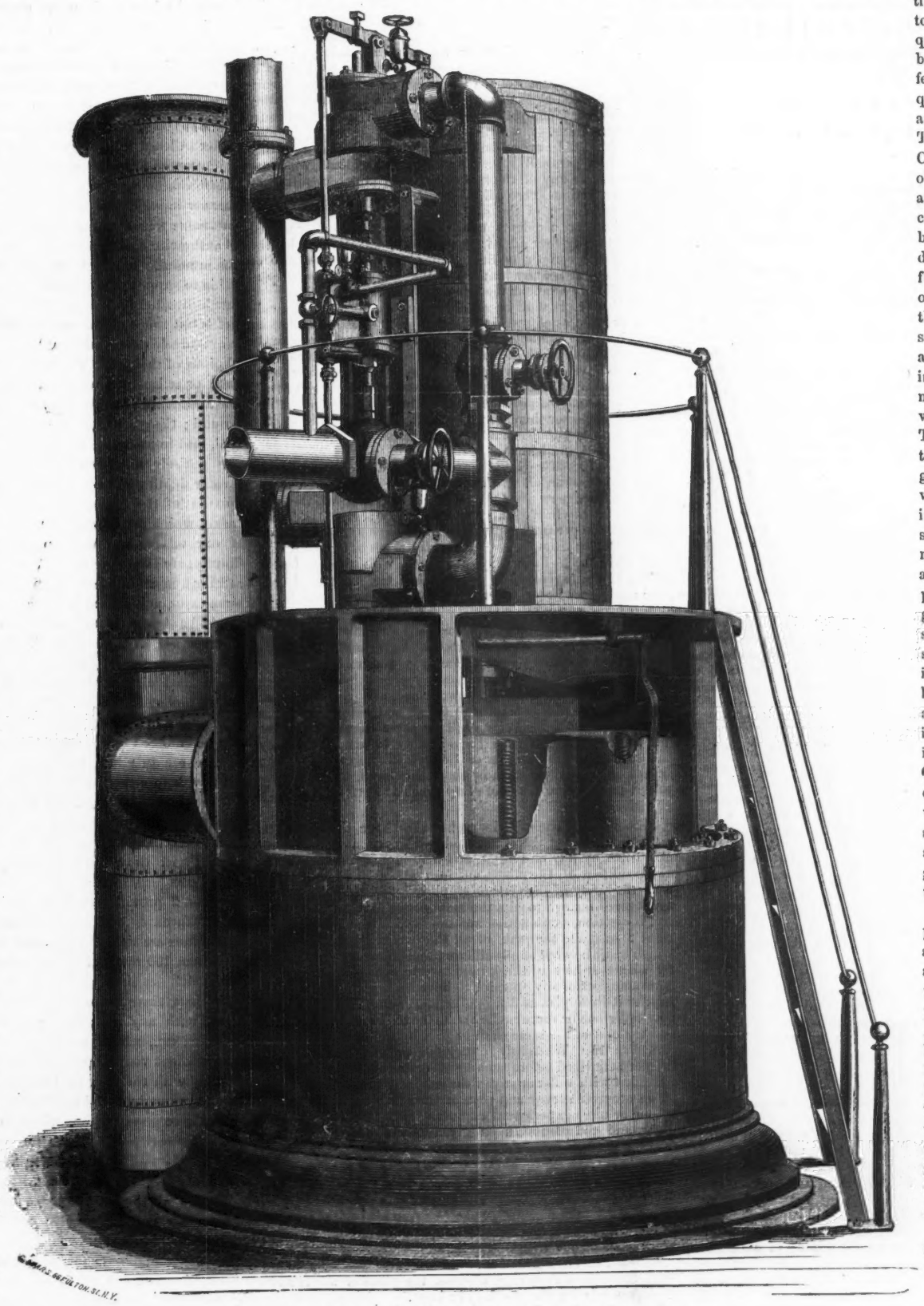
## UPRIGHT BLOWING ENGINE.

We this week present an engraving of a Blowing Engine, which, for elegance of design and efficiency of construction, will challenge comparison with any that have come under our observation. It will be seen that the air, steam and valve cylinders are vertical—an important point, as in this way all wear and friction from the drag of the piston and rod are avoided, and the cylinders do not wear on one side, as is the case with horizontal machines. By this arrangement it is possible to secure a degree of compactness greater than is compatible with any other form. Unlike the machines in which the movement of the piston is governed by a crank and fly-wheel giving an unequal motion to the plunger, this has a uniform speed—loosing and receiving motion instantly at the end of each stroke. In the engine from which our figure is taken, the steam cylinder is thirty inches in diameter; the air cylinder is sixty inches in diameter, with a stroke of five feet, which gives a cubic capacity of about one hundred feet. The arrangements for lubricating and packing are simple and easy of access. Its speed can be varied from one to fifty strokes per minute. Diameter of steam supply pipe five inches. The ground room occupied by this Blower is ten feet by ten feet. Hight from foundation to top, fourteen feet. Diameter of air discharge, twenty inches. Hight of discharge flange above floor, six feet. Total weight, ten tons. These engines are manufactured at the Norwalk Iron Works, Norwalk, Conn.



UPRIGHT BLOWING ENGINE FOR BLAST FURNACES, ETC.

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### Construction of Blast Furnaces.

An interesting and instructive experiment, bearing upon the construction of blast furnaces, has recently been made at the "Consett Iron Works,' at Durham, England. The Consett Iron Company smelt each year about 200,000 tons of ore in four blast furnaces. At present the waste gases are only taken from one furnace, on the bell and hopper system, but one of the furnaces is being altered so that the waste gases can be taken off on a modification of the side flue system, a little novel in character. The blast is heated just now to 1,000 degrees by a couple of ∩ cast-iron pipe stoves. These are to be removed, and four stoves on Whitwell's principle substituted, from which the best results are anticipated. Mr. Radcliffe, the superintendent, believes that the extraordinary results obtained from the high and large furnaces now popular in the Cleveland District are due not so much to the dimensions of the furnace as to the excessively high temperature of blast with which they are worked, and is inclined to the opinion that the proper capacity of furnaces has been overstepped, and cites the following interesting fact in support of his theory. Sometime since it was decided that a new furnace should be erected at Consett, with a hight of seventy feet. It was built and worked for some time; but the yield per ton of coke and the quality of iron were both found to be inferior to the yield and quality from the other and smaller furnaces. The furnace worked on Cleveland and hematite ore with a very good and clean coke quite capable of carrying the burden. It was then determined to cut the furnace down to a hight of fifty-five feet, and the result was eminently satisfactory; the yield and quality were greatly improved, and the furnace is now one of the very best in the district. The blast is supplied by two high-pressure engines of an old type, with 6 ft. 6 in. blowing cylinder, nine feet stroke, and a supplementary engine, which also drives a pair of plate rolls. The waste gases are used to raise steam in a magnificent set of new boilers, six in number, each 70 feet long, egg-shaped, with a diameter of 3 ft. 10 inches. They are set in a very peculiar way. Cast-iron columns are erected on the brickwork in which they are set, and on these are supported five cast-iron girders running across the tier of boilers.

From these girders depend sling stays, which are secured to double angle iron semi-circular rings riveted to the upper side of the boilers. A straight flue, 70 feet long, runs the whole length of the boiler below, right to the stack. The stack in connection with these boilers is 250 feet high, and 24 feet diameter inside at the base.—*Bulletin Am. I. & S. Ass'n.*

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### Museum of Machinery.

The Massachusetts Institute of Technology is about to organize and establish a Museum of Arts, for one department of which a novel plan, and one of special interest to inventors, has been adopted by the Curator, Mr. S. P. Ruggles of Boston. Instead of making an unwieldy collection of models of complete machines, at a great cost of money and space, it is pro-

posed to make a museum of the elements of machinery—a tangible encyclopedia of those simpler parts which repeat themselves in different ways in all machines. It is intended to collect working models of all the primary devices for transmitting, directing, or modifying force and motion, and then classify those models according to subject, to catalogue them with precision, and to arrange them in order in suitable cabinets. The many singular and evident advantages of such a Museum are, first, that it would be of manageable size; second, that it would never grow old; that it could always be added to with ease; and fourth, that its simplicity and completeness would make it more profitable for study than a collection of models or pictures of entire machines. This proposed classification of models of the elements of machinery must be especially serviceable to inventors, aiding them very much as authors are aided by dictionaries and gazetteers. Inventors have hitherto been left too much to their own unaided devices, but the collection which Mr. Ruggles proposes will instruct them, as a class, in what has been already achieved, and thus prevent, at least to some extent, the waste of time and strength involved in re-invention. It is vaguely believed that inventors are a useful class in the community, but the importance of aiding them in every possible way in their civilizing work is seldom fully realized. There is scarcely a comfort or a luxury of modern life that is not owed to them, and through the aid of the machinery they have created a single man can do more work to-day than a thousand could have half a century ago. The Massachusetts Institute of Technology, in undertaking this important work, appeals confidently to inventors, constructors, and all persons interested, for detailed drawings of the peculiar elementary features, the characteristic parts of such inventions as are within their knowledge, accompanied by the necessary descriptions. Where working drawings cannot be furnished, sketches with full descriptions will be available substitutes. *N. Y. Tribune.*

### Imspection of Mines.

The following is the text of the act now pending before the Pennsylvania State Legislature for the better regulation and ventilation of mines and for the protection of the lives of the miners in the county of Schuylkill. A letter from our esteemed correspondent, Mr. Rothwell, discussing its provisions, will be found in another column.

Section 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same.* That it shall be and it is hereby made the duty of all superintendents, lessees, operators, owners, mining agents and other persons controlling and directing the mining of anthracite coal in the county of Schuylkill, to provide for, arrange and establish in each of the mines superintended, leased, operated, controlled or directed by them and each of them an adequate amount of ventilation and of circulation of pure air, to dilute and render harmless all noxious gases therein to such an extent that the working places in every such mines or colliery shall be in a fit state for working therein and free from danger to human life by reason of said noxious gases.

*Section* 2. That in providing for and establishing ventilation in the mines aforesaid, furnaces and suction fans may be used therein, and if underground furnaces be used for such purposes, they shall be so erected as to prevent ignition of the coal in the mines, the fire of the same shall be fed with fresh air, and the vitiated air of the mine shall not be allowed to come in contact with the furnace, but shall be made to pass into the up-cast air course at a point far enough above the fire to insure against the ignition of the fire damp, which said return air current may contain, and if suction fans are used, they shall be substantially built and be of such size, and the air courses shall be of such dimensions as to insure an abundant supply of fresh air in all the working places of the mine without moving said fans at a greater speed than one hundred revolutions per minute.

*Section* 3. It shall also be the duty of said superintendents, lessees, operators, owners, mining agents and other person or persons controlling and directing the mining of anthracite coal in the county aforesaid, to select and employ one competent and qualified person for each of said mines or collieries, who shall be known as the mining boss, who shall be by them paid, and who in addition to such other duties as he may contract to perform, shall keep a careful watch over the airways, the traveling ways, the timbering and all things connected with the safety of the workmen, and also, in connection with his assistants, shall examine carefully the whole of the workings every morning, before the miners enter the colliery, and shall ascertain that they be free from danger, and the workmen shall be prevented from entering any portion of the mines until such examination has been made and the cause or causes of danger be removed, and all entrances to any place containing dangerous gas of any kind shall be by him properly fenced off, so as to prevent access thereto.

*Section* 4. All safety lamps used in mines shall be the property of the operator or lessee of said mines, and shall be under the exclusive charge of the mining boss, and it shall be the duty of such mining boss to keep the said lamps in good order, and to provide that all doors used for assisting or in any way affecting the ventilation shall be so hung that they will close of their own accord, and the main doors in collieries in which the inspector hereinafter named shall deem it necessary and so order, shall be provided with a boy, whose constant business shall be to guard them and prevent their being left open.

*Section* 5. It shall also be the duty of said superintendents, lessees, operators, owners, mining agents and other person or persons controlling and directing the mining of anthracite coal in the county aforesaid, to provide every working slope or shaft to the surface, and from the surface to the bottom of the same they shall also provide a sufficient cover overhead, which shall be used when lowering or raising persons in every working shaft, and they shall arrange that flanges or horns of sufficient length shall be attached to the drum of any machine that is used for lowering or raising persons into or out of any of said mines.

*Section* 6. It shall be the duty of the owner or operator in all mines hereafter opened to start, continue and maintain good, substantial and reliable up-cast air-ways, of a size sufficient to draw the necessary quantity of air through the workings of said mines at all times, and also the necessary distributing air-ways, which said air-ways shall be kept independent of each other until they terminate in the up-cast air-shaft, and upon their neglect or refusal so to do, they shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by imprisonment and fine, at the discretion of the court trying the same.

*Section* 7. Every engine man shall constantly attend to the engine of which he has charge, and shall not allow any person, except such as may be deputed by the operator or his agent, to touch or meddle with it or any part of its machinery; he shall work his engine slowly and with great care when any person is descending or ascending from the shaft or slope, and when any person is about to descend or ascend from a slope or shaft, the men at the bottom or at the top must inform the engine man by signal or otherwise, and it shall not be lawful for any one to ride upon a loaded wagon or cage in any slope or shaft in any of said mines, and upon neglect or refusal of the said engine man to control his engine, as aforesaid, he shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by fine and imprisonment, at the discretion of the court, and any one so riding upon said loaded cage, wagon or car, as aforesaid, or any operator or mining boss permitting the same to be done shall be deemed guilty of a misdemeanor and fined in a sum not exceeding fifty dollars, upon conviction thereof.

*Section* 8. The neglect or refusal of any of the said superintendents, lessees, operators, owners or mining agents to do and perform any of duties enjoined upon them by Sections one, two and three of this act, shall be a misdemeanor, and upon conviction thereof he or they shall be punished by fine and imprisonment, at the discretion of the court trying the same.

*Section* 9. The neglect or refusal of any mining boss to perform the duties enjoined upon him by the provisions of Section four of this Act shall be misdemeanor, and upon conviction thereof he shall be punished by a fine not exceeding fifty dollars, and imprisonment, at the discretion of the court trying the same.

*Section* 10. In every case in which an explosion resulting in death or personal injury, and of any accidents whatever in or about any of the said collieries or mines, resulting in death or serious personal injury, it shall be the duty of the party in charge of the said colliery to give notice of such explosions or accidents to the inspector hereinafter named within twenty-four after its occurrence, and it shall be the duty of the coroner of Schuylkill county to give notice of every inquest held by him upon the body or bodies of persons killed in or about the mines or collieries aforesaid.

*Section* 11. It shall be the duty of every operator of a colliery or mine, as aforesaid, to keep in good order all boilers in and about the collieries, and coal breakers used for generating steam, and it shall be the duty of every operator or his agent to have all such boilers examined once a year by a boiler maker or other competent person, and the result of all and every such examination shall be made known in writing to the inspector hereinafter named, unless said inspector shall deem any such examination unnecessary, when the same may be postponed for two years.

*Section* 12. The Governor of the State of Pennsylvania shall have power, and it shall be his duty to appoint a properly qualified person for the office of inspector of the coal mines of Schuylkill county, whom he may remove at pleasure, and the person so appointed shall have attained the age of thirty-five years, be a citizen of the State of Pennsylvania, and have been intimately connected with the anthracite mines of Pennsylvania for a period of ten years, and have had experience in the working and ventilation of coal mines where fire-damp is evolved.

*Section* 13. The said inspector shall give his whole time and attention to the duties of his said office, and it shall be his duty to examine all the collieries in the said county of Schuylkill, to see that every necessary precaution is taken to insure safety to the lives of the workmen, and to see that all the provisions of this act are observed and obeyed, and the salary of the said inspector shall be three thousand dollars per annum. It shall also be his duty to attend at every inquest held by the coroner of Schuylkill county upon the bodies of persons killed in or about the mines, and to ascertain if possible the cause of every accident resulting in death or serious injury.

*Section* 14. The said inspector shall have the right to enter and inspect the mines and machinery at all reasonable times by day and night, and may inquire into the state and condition of the mines, and into all matters connected with the safety of the persons employed, and the operator or agent shall furnish to him the means necessary for such entry, inspection, examination and inquiry. He shall have the right to examine the plan of all the workings of the mine which shall be kept at all collieries, and shown to the inspector whenever he may think necessary to examine it, and in case of neglect of any operator to have such plan of his colliery, or if such plan is deficient or inaccurate, said inspector may order one or more engineers to have such plan made, and the cost of the same shall be paid by the operator.

*Section* 15. When any coal mine or any level or lift thereof is finished before such level or mine is abandoned, and filled with water or any of the gangway pillars are removed, an accurate survey and plan of the same shall be made by one or more experienced engineers, at the cost of the operator, and said plan shall be given to the inspector, who shall file the same in his office for future reference, and on failure to furnish said plan, the cost of the same shall be collected from the said operator by action, as debts are by law recoverable.

*Section* 16. The inspector shall be provided with an assistant, who shall act as clerk, whom he may appoint, whose salary shall be one thousand dollars.

*Section* 17. The office of the said inspector shall be kept in the borough of Pottsville, wherein the plans of mines and all papers relating thereto shall be kept.

*Section* 18. It shall be the duty of the inspector to make a report to the Governor of the State of Pennsylvania within one month after the close of each and every year, wherein the results of his labors shall be set forth, all the accidents in and about the mines fully enumerated, and the state of the workings of said mines with regard to safety and ventilation.

*Section* 19. The salary of the said inspector and his assistants, and the expenses of carrying into execution the provsion of this act, shall be paid by the State Treasurer out of the treasury of the Commonwealth of Pennsylvania, upon the warrant of the president judge of the court of common pleas of said county of Schuylkill. *Provided*, That not more than four thousand dollars in any one year shall be paid therefor.

## Practical Letters.

### THE INSPECTION OF MINES.

Wilkesbarre, Pa., March 3, 1869.

Editor Journal of Mining:

Sir:—There is now before the Pennsylvania State Legislature an Act for the better ventilation of mines in Schuylkill County. It is also proposed to extend its operation to Luzerne County. It is a question of the highest importance, and you can effect much by your great influence in endeavoring to obtain as perfect an Act, or rather, as perfect an inspection under the Act, as possible. The enclosed copy of the Act [printed elsewhere in this week's Journal of Mining.—Ed.] will show what is proposed, though I trust the Act, as finally passed, will contain many sections not found here.

There can be no doubt that an efficient inspection of our coal mines would prove exceedingly beneficial to the mining interests generally. We have only to look at the immense improvement made in mining and ventilation of mines in England since the appointment of Government Inspectors in 1850—and this improvement is unquestionably due in great part to the attention directed towards these subjects in the official reports of the inspectors—in order to learn what we may reasonably expect from the adoption of a similar system here. The time has come when something should be done to draw attention to the manner in which we are working our coal mines; to the enormous waste of our by no means inexhaustible supply of anthracite coal; and to the loss of life incurred in getting the mineral. It has been common outside of the coal fields to suppose that anthracite coal does not evolve the much-dreaded fire-damp. The fallacy of this popular belief is but too well known in many of our mines, where a year scarcely passes without the loss of several lives by explosions of this gas. The fact is, that up to the present time, or at least till within a few years, the workings in our anthracite mines were mostly near the surface of the ground; the gas had, consequently, been drained from the coal, and in many of the mines such a thing as fire-damp was entirely unknown. Now, as the workings attain greater depths, and are conducted in the more disturbed portions of the basins, the quantity of the miners' great enemy which is met with is found to increase; and some of our mines, and more particularly those in Schuylkill County, are becoming entitled to the epithet "fiery," and call for a more efficient ventilation. That alone will, in some cases, necessitate a better system of mining, for it would be absolutely impossible to ventilate efficiently some of our mines, as now worked. It is generally conceded that a proper regard for the safety of the men can scarcely be obtained without the intervention of laws obliging the proprietors and operators of mines to provide for it; and it is equally evident that the observance of such laws can only be enforced by the appointment of Government officials, whose duty it is to enforce such observance. The Act now before the Legislature proposes many very proper and essential conditions, but it also contains some which are decidedly injurious, and which, if carried into force, would effectually prevent any efficient system of inspection. I will draw attention, at present, only to a few points.

Section 2 provides that in establishing ventilation in mines, "furnaces and *suction fans may be used;*" and if suction fans are used, "they shall not be run at a greater speed than 100 revolutions per minute." Here are conditions which are simply absurd; for besides furnaces and *suction* fans, there are a great number of other artificial means, such as *forcing* fans, air pumps, steam jets, water falls, etc., etc., which, under suitable circumstances, may prove efficient ventilators; and there are many fans made expressly with the view of running at a much higher velocity than one hundred revolutions per minute, and which will not give good results, unless so run. This condition is therefore entirely *impracticable*, and, even if it were not so, it would be difficult to imagine any desirable object attained by it. What we want is a sufficient quantity of fresh air in all the working places of the mine, to render the same safe and wholesome; and so long as the means employed to procure this ventilation be not in themselves sources of danger, we should allow the operator free choice in their selection. Let him use the best means, though it may not be either "furnace" or "suction fan." Why impose any restriction on his selection?

There is also a very objectionable feature in Section 12, which provides that the inspector, who is appointed by the Governor of the State of Pennsylvania, shall be *removable at his pleasure.* This has every appearance of being designed to make the appointment a *political one;* a condition altogether inconsistent with an efficient inspection.

We know too well already the effect of allowing an office to be made a reward for political support. Much more attention is paid to the appointee's political opinions, whether he be "radical" or "copperhead," than to the consideration of his knowledge of his profession and fitness for the place. Then again, Section 12 provides that the inspector shall have attained 35 years; be a citizen of the State; have been intimately connected with the anthracite mines of the State for ten years, and be acquainted with the working and ventilating of mines evolving fire-damp. What we want is *the best man* we can get. It is, of course, essential that he should have experience in "fiery mines;" but when he has that, and is a competent person, what more is wanted. It is the same thing as limiting the operator to the use of a "furnace" or a "suction fan," and "100 revolutions of the latter per minute." It looks as if some gentleman, in Schuylkill County, possibly, had put in these clauses for his own especial benefit; for to be over 35 years of age, to have been ten years connected with anthracite mines; to be a citizen of the State, and to be familiar with mines evolving fire-damp, will limit the choice of inspectors to an exceedingly small number, and those not by any means necessarily those who would make the most efficient inspectors. It would scarcely have been more injurious, and it might have been more explicit, if the bill had specified the height and weight, etc., of the inspector for Schuylkill County. It would, I think, be of much greater utility to say that "the inspector can be removed only on proof of incapacity, inattention to his duties, or malfeasance in office; that he shall be a competent and experienced mining engineer, familiar with the working and ventilation of mines where fire-damp is evolved, and acquainted with the various systems of mining, etc., adopted in coal mines." We want an efficient inspection, not a political inspector. Let the Governor have as wide a field for his choice, as the operator in the selection of his ventilator. It would also be highly desirable to require additional guarantees from the inspector for the full and faithful discharge of his duties.

The point which appears the first essential, viz: that the inspector shall be taken from among the best men we have—a competent and experienced mining engineer—necessitates a change in the section limiting his salary to $3,000 per annum. It is very evident that a first-class man *cannot be induced* to accept the position with such a salary. He must live most of his time at the hotels, with heavy traveling expenses. I doubt if the services of such an engineer could be secured at $5,000, and the assistant's salary could not be less than $1,500.

There are several other points to which it would be desirable to call attention, but these appear to be the most important sins of *commission*. Those of omission will require another article. R. P. ROTHWELL, M. E.

### Safety Pressure for Rolling Mills.

Our attention has recently been invited to the patent of Messrs. Jno. Spencer and Dougall McCorkindale, Coatbridge, by which a safety pressure arrangement is adapted to the various classes of rolling mills. It is useless to enlarge upon the fact that break-downs in rolling machinery are amongst the most frequent annoyances to which a mill manager is subjected, though, at the same time, it must be confessed, that only a moderate degree of attention appears to have been devoted to the construction of machinery that shall, in some way or other, be rendered proof against the breakages that are now so constantly occurring. The plan alluded to in this notice, is to attach a series of levers to one set of rolls in each train, and these can be weighted so as to afford any resistance that may be required. If a piece of cold iron should accidently get into the rolls, the extra pressure simply causes the rolls to separate so as to allow the obstruction to pass, and afterwards the mills adjust themselves without difficulty. The levers and weights are arranged in pits beneath the floor of the mill.—*The Iron Trade Review.*

### The Newspaper Business.

The circulation of some of the principal periodicals in the country is given as follows: New York Weekly Tribune 190,000, Harper's Weekly 100,000, Harper's Monthly 112,000, Harper's Bazar 70,000, New York Weekly 200,000, Atlantic Monthly 50,000, Independent 80,000, The Little Corporal 80,000, American Agriculturist 160,000, Our Young Folks 40,000, Putnam's Magazine 15,000, The Manufacturer and Builder—a new monthly magazine only three months old—10,000, Frank Leslie's Chimney Corner 85,000, Frank Leslie's Illustrated 45,000, Frank Leslie's Ladies Magazine 50,000, Galaxy 20,000, Phrenological Journal 50,000, Riverside Magazine 20,000, Our School Visitor 20,000, Peterson's Magazine 140,000, Godey's Lady's Book 106,000, Round Table 7,000. La Crosse Democrat 300,000, North American Review 2,000, Lippincott's Magazine 10,000.

☞ A new apparatus for testing the point of ignition in petroleum and parafine oils has been invented and manufactured by Mr. A. Casartelli, of Liverpool. The instrument is very simple in construction, readily understood, and for accuracy and sensitiveness its performance is said to be everything that can be desired. It has been highly approved of by Government, and as the new Amendment Act, regulating the sale of such oils, came into force on the 1st instant, compelling the application of tests, it promises to become generally adopted throughout the oil trade.

# Mining Summary.

## GOLD AND SILVER.

## Montana.

THE WHITLATCH UNION MINES.

All interested in the mines of this Territory, or, indeed, in those of any of the Territories, will find in the following account—which, by the way, is copied from the Helena *Post*—much that is interesting, if not instructive. The writer first speaks of

THE LAY-OUT.

"In this dollar-getting hard-fisted day, among a people who have to wrestle with the stubborn obstacles of nature like gladiators, and capture fortune's prize from the strongholds of the earth, the geological theories of formation are secondary to this, the all absorbing question, 'what does it pay?' In an article therefore intended to give a practical idea of one mine of Montana, that takes precedence of many others merely because it has been developed to a greater extent and in such manner as practical sense and experience dictate, we propose to give facts and figures in plain terms, leaving to other pens or other times the glowing burnish of superlatives and profound disquisition on the relative merits of Werner's theory of aqueous deposition, Hutton's ingenious injection, and Von Buch's conservative ideas of co-operation which Brigham Young has recently carried into the green-grocery business and clothed in the sanctity of prophetic enunciation.

THE SITUATION OF THE MINES.

"Four and a half miles from Helena, in a summit gap of the range that forms the western boundary of the valley of the Missouri, and juts but its granite cliffs, protecting Helena, nestled at the base, from the fierce attacks of shrieking nor'westers, is an outcrop of gigantic boulders, a few feet wide, extending northwest and southeast, which the eye can trace for miles, dipping down into valleys, perhaps hidden beneath the soil, and beyond, again on the hills projecting boldly. The line is perfectly straight, however, showing that whatever convulsion of nature threw aloft this mountain range, did it in a systematic and orderly manner, without any subsequent disarrangement. Extending parallel with this line of boulders is the granite formation, and in a fissure of it are the Whitlatch, Union, Parkinson, Gonu, Walrussia and Park Lodes, upon which, in the various departments of development, reduction and accessory labor, are employed throughout the year from 600 to 700 men. These mines all come under the general designation of the Whitlatch Union, that lode having been the original discovery, and the others extensions upon it.

THE DISCOVERY.

"In September of '64, a miner, with several years experience in Colorado and Nevada, having prospected, developed and superintended some of the best mines of those localities, and met with financial misfortune, turned his steps towards Montana with 'quartz on the brain,' and after prospecting the Summit, Hot Springs, Ramshorn and Mill Creek Districts, finally invested his last 'shiners' in galena silver quartz, located at the head of Prickly Pear, but which proved intractable from the presence of antimony and copper. 'Bursted,' he yoked up and journied to Last Chance Gulch for winter quarters, and camped his 'outfit' on what are now Taylor & Thompson's claims. Believing that quartz is the mother of placer gold, and incited by the richness of Last Chance, the little party of eight men passed up Last Chance and Grizzly Gulches, and, locating in Grizzly Gulch, below the Park, erected a cabin, and proceeded to prospect for quartz. Weeks sped on without success, while the placers below yielded fabulously. All save 'old indomitable' were discouraged, and a day was fixed, after which, if no quartz was found, the attempt was to be abandoned. The day appointed came, the hills had been traversed in every direction, the seven miners had gone cheerily to the cabin in the evening, anticipating the release from their engagement and the fortunes in store by gulch mining. But 'old indomitable' lagged behind. A fragment of quartz caught his eye, the blows of the pick fell fast, and ere the hour had gone the 'Whitlatch Union' mine was discovered. To-day the pick-handle, broken by the vigorous, nervous blows of that hour, lies by the gopher-hole where 'Jim Whitlatch' conquered fate and began work on the mine that has added more than a million dollars to the product of Montana, and made the first opening on a lead from which 30,000 tons of rock have been crushed.

DEVELOPMENT.

"The lead where first discovered was but one foot in width, and averaged about $40 per ton. During the winter of '64-5 the incline was run to a depth of 130 feet. The first 40 feet the lead averaged only 11 inches, and then pinched entirely out, leaving but a seam of clay or slickensides; 20 feet farther it was struck again, 20 inches in width, and increased to three feet; but although in other shafts immense bodies of ore, 15, 20 and 21 feet in thickness, have been struck, the original shaft has never had a crevice of over three feet, an encouragement to those who do not strike the best pay in the first shaft. At the present time the deepest shaft is that on No. 1 west (I X L Company), 407 feet. Over two miles of shafts, adits and galleries, 10,560 linear feet, have been run within the 2,600 feet opened on the mine. The 'stoping down' would more than double the amount of excavation indicated by these figures, while more than as much ore as has been taken out is open to access. The mine throughout has been timbered in the most substantial manner, and an earthquake would have some difficulty in making trouble to the miners.

THE YIELD.

"The first ore crushed from the Union Whitlatch mine was crushed in the National Mining and Exploring Company's mill in September, 1866. The Turnly mill and the Hendrie mill, each, began reduction in December, 1866; Sensenderfer mill in September, 1867. These mills have since, in round numbers, crushed the following number of tons:

| | |
|---|---|
| Turnley Mill | 2,500 tons |
| Hendrie Mill | 2,700 tons |
| Hodge Mill (Nat. M. & E. Co.) | 9,000 tons |
| Whitlatch and Sensenderfer | 10,000 tons |
| I X L (Ricker & Price) | 8,000 tons |
| Total | 32,200 tons |

"The average yield per ton is $31 10, currency, making an aggregate yield of $1,001,500. This is 'the rock as it runs.' Selected ore as high as $87 per ton, gold, and the first 1,000 tons crushed in the Turnley mill averaged $63 per ton in gold.

NATIONAL MINING AND EXPLORING COMPANY, OF NEW YORK.

"This, better known as the 'Hodge Company,' was the first purchaser on the Whitlatch Union. The company purchased of Mr. Whitlatch, late in 1865, what was then known as discovery claim on the 'Owyhee,' but which has since proven to be No. 4 west of the 'Union Whitlatch,' and have since purchased the adjoining undeveloped claim No. 5 west, making 600 linear feet in all. The company consists in part of the following persons of New York City. Jas. A. Roosevelt & Son, Sheffilen Bros., Messrs. Waggstaff, Haines & Dodge, Jr. A 10-stamp-mill was erected in Unionville at a cost of $25,000, and commenced crushing in September, 1866; additional machinery (10 stamps) in 1867, cost $10,000

| | |
|---|---|
| Depth of deepest shaft on No. 2, west | 345 feet |
| " " " " No. 4, west | 150 feet |
| Total shafts, galleries, etc | 5,100 feet |
| Total cost of machinery, 20 stamps (about) | $35,000 |
| Tons of ore crushed | 9,000 |
| Yield to date, currency | $225,000 |

"The width of crevice in No. 2, from which the principal part of the ore has been taken, varies from 4 to 5 feet, with a 10 feet crevice at the deepest point, and the best indications they have yet had.

WHITLATCH UNION MINING COMPANY.

"This company is composed of James W. Whitlatch, and the claims worked were Discovery and Nos. 2 and 3 west. Work was begun on Discovery and No. 2 in February, 1865, and No. 3 in the spring of 1866. Up to the time of sale the shaft on Discovery was sunk 190 feet, No. 2 west, 50 feet, and No. 3 west, 120 feet, yielding from Discovery 1,450 tons of ore; from No. 2 west 50 tons, and from No. 3 west 3,700 tons. Of this, 2,700 tons were crushed in the Turnley mill, the first 1,000 tons yielding $63 per ton in gold; 2,500 tons were crushed in the Hendrie (now I X L) mill. Owing to the high price of labor, tools, supplies, etc, and the lack of capital to take advantage of the market, the cost of mining was $7 per ton in gold, and the price paid for crushing was $15 and $18 per ton in gold.

| | |
|---|---|
| Total tons crushed | 5,200 |
| Yield in currency | $296,500 |
| Average per ton | $57.00 |

"The money received from the above was expended in the further development of the Union and other mines throughout the Territory, and it is but according to Mr. Whitlatch what is justly his due, in asserting that he has labored against and conquered obstacles that would have proven insurmountable to almost any other; labored without capital in the effort to develop the quartz of Montana, labored with high prices and usurage greedily grasping the dollars that came slowly in the first trying days, toiled on while others were dismayed and yielded, and has finally achieved success and established the fact that the mines of Montana *will* pay. While others may give him the empty title of 'The Quartz King,' we yield him the credit of having done more to develop the mines and establish for Montana the precedence she deserves, than any other man in it, and in these days when the long struggle is over and Jim Whitlatch is easy with the world, there are none more deserving or who use their means more liberally in the advancement of all worthy public enterprises.

I X L.

"This company is composed of J. C. Ricker and M. A. Price. They own 200 feet—claim No. 1 west—and began development in August, 1867. They are now down 407 feet, the deepest shaft on the mine, and are actively engaged in taking out ore. The crevice at the depth of 407 feet is perfect, and full four feet in width, the ore yielding better below the water level, which is struck generally near the 300 foot level. Their mill was erected and began crushing in October, 1867.

| | |
|---|---|
| Depth of deepest shaft, No. 1, west | 407 feet |
| Total shafts, galleries, etc | 2,000 feet |
| Total cost of machinery, 24 stamps | $26,000 |
| No. of tons crushed | 8,000 |
| Yield to date, currency | $250,000 |

WHITLATCH AND SENSENDERFER COMPANY.

"The one-half interest in No. 3 east and No. 3 west, on the Union, was purchased by Mr. Sensenderfer from Mr. Whitlatch in June, 1867, and a 30-stamp-mill erected and started in September, 1867. The ore crushed to this time has all been from No. 3 west. The 500 feet on the mine, mill and appurtenences, has recently been sold to a Philadelphia company, composed of wealthy and prominent gentlemen, and is now known as 'The Columbia Mining Company of Montana,' and is under the able management of B. H. Tatem. The success of this mill has been all its owners could desire, and we have knowledge that in less than nine months the net profits fully covered the entire investment in mine and mill. The mine at present has a body of very rich ore at its greatest depth 8 feet thick.

| | |
|---|---|
| Depth of shaft on No. 3, west | 360 feet |
| " " No. 3, east | 100 feet |
| Total shaft galleries | 2,100 feet |
| Cost of machinery, 30 stamps | $35,000 |
| Tons of ore crushed | 10,000 |
| Yield to date, currency | $230,000 |

"The mining companies previously described constitute those which have mills erected, and have crushed ores entirely from that portion of the lode known as the Whitlatch Union, and within the boundaries of 2,200 feet. Claim No 4 east is owned equally by E. S. Mansfield & Co. and the Columbia Company, and is undivided. Messrs. E. S. Mansfield and E. Hodson also own the eastern half of No. 2 east. This, with the ground already enumerated, constitutes the 2,200 feet which can be taken up as one lode. The westward extension is designated the Parkinson lode, and what is known as Discovery Claim on that lode would be No. 6 west on the Union. Work is being prosecuted here by

THE WHITLATCH MINING COMPANY, (PARKINSON LODE,)

"Owning Discovery and No. 1 west. The owners are James W. Whitlatch, 200 feet; J. Parkinson, 50 feet; W. Parkinson, 50 feet, and C. McClure 50 feet. A shaft was commenced on Discovery October 10, 1868, and is at present in 155 feet. The amount of ore taken out is 600 tons, of which 155 tons have been crushed in a custom mill, yielding $23 50 per ton, although this yield does injustice to the ore, from the fact of the mill saving but a small percentage of the gold through imperfection of machinery. The width of the lode at the bottom of the 155 feet incline is 8 feet of pay ore. A drift was run east, at the 100 feet level, a distance of 60 feet, showing 9 feet average of pay ore and 14 feet at the extreme end of the drift. The west drift on the same level shows 8 feet of pay ore. This is the best showing in any claim yet opened at a depth of 100 feet, the wall rock being soft and easily worked, while the ore is of the same general character and firmness as in the Columbia Company's claim No. 3 east. It is conceded by all miners that this is the finest opening yet made, the ore deposit being of extraordinary width, richness and regularity, and can be delivered at the surface for $3 per ton, currency.

ESSEX MINING COMPANY, (PARKINSON LODE.)

"This company, composed of Thos. Parkinson, W. Parkinson, Thos. Argyle and C. McClure, owns 1,800 feet, comprised of the claims from No. 2 to No. 10 west, inclusive. This they have received a patent for (the first granted in Montana) from the United States Government, including a mill site of 10 acres, located on Grizzly Gulch, one-fourth of a mile from the mine. The development so far consists of one shaft, 30 feet deep, showing a well defined crevice of three feet. Having secured their

patent and now receiving an income from the product of the Discovery Claim, they propose to push developments and erect a mill at an early day. The limit of this article prohibiting description of the development and product of the Park and other lodes, which are assuredly but continuations of that already described, we shall leave that to another time and close with brief

GENERAL REMARKS.

"We have seen that the quantity of ore crushed from the Union Whitlatch mine to date is 32,000 tons, and that the first ore was crushed but little more than two years ago. The average yield of the ore has been $31 10 per ton, giving an aggregate product of $1,001,500 in currency. Owing to the high price of labor, and the necessity of procuring reduction in custom mills as late as 1866, this would have left no margin for the owners of the mines, as the amount of cost per ton was $25 in gold, when it was at a premium of over 100 per cent., while the product has only averaged $6 10 more than that in currency. The comparison between then and now is shown by the following:

| | 1865–6, gold. | 1868, currency. |
|---|---|---|
| Labor per day (board included) | $5@7 | $1 75 |
| Board per week | 14@18 | 10 00 |
| Mining per ton | 7@8 | 3 00 |
| Reduction per ton | 17@18 | 10 00 |
| Wood per cord | 7@8 | 4 00 |

"There are now 94 stamps in the five mills erected adjacent to the mine, with a capacity of one ton per stamp each day. The total cost of this machinery to-day would not exceed $120,000. It has the capacity to reduce 22,500 tons per annum, 20 working days to the month. The gross product, at $31 10 per ton would be $706,616 per annum, and the net profit would be $307,763 over and above the actual jobbing prices of mining and reduction. Considering that the ore taken out of the Union might be quadrupled; that there are three known extensions on the lead, each probably as good as the original, and only 60 or 70 per cent. of gold is saved where fully 90 per cent. might be extracted, it will be seen that we have one lead now, which, two years ago would not pay expenses, capable of yielding, with a fuller force of labor and an adequate amount of good machinery, over $11,000,000 per annum. This is no guess work, for the Parkinson and Park extensions are not inferior to the originally discovered mine, where they have been opened, machinery can save 90 per cent. of fire assay, and the other calculations follow. Every mill at work on these ores is making heavy profits. We have no doubt that within a twelve month the number of stamps in the Park District will be doubled, and a dozen companies reaping rich reward for their investment, and every successful mill is an advertisement for and an aid to the Territory. Those interested in the development of quartz have been contending against exorbitant prices for everything necessary to their purpose. The struggle has been a hard one, but perseverance, energy and indomitable will has kept its grip on the Union Whitlatch until better opportunities have come to their rescue, and they are now amassing fortunes. The Whitlatch Union does not claim superiority, except in that it is proven up and found good, and there are doubtless many others now being developed that will equal or excel it. In all the camps development is preceding the purchase and erection of machinery, the reverse of which has been so disastrous, and all things look favorable to those interests upon which Montana principally depends for permanency as a land of gold and silver."

## Colorado.

THE GEORGETOWN SILVER MINES—PRODUCTION FOR 1868—REDUCTION AND DRESSING WORKS.

All interested in silver mining in Colorado will read with interest the following letter from the editor of the Denver *News*, in which mining operations in and around Georgetown are carefully reviewed. Says the writer:

"It may be well to preface my figures with the remark that these mines were first opened in the winter of 1866-67. The early miners of Colorado prospected for gold and not for silver, and therefore, although the existence of lodes in this neighborhood was long known, they were not regarded as of any value previous to the date mentioned. Then their development began, small reduction works were erected, a town was started, and to-day Georgetown and her mines are second only to those of Central and Black Hawk, while the question of which shall occupy the first place is still open for the future to decide. Of the progress which these silver mines have made in two years, the following figures will speak.

THE PRODUCT FOR 1868.

These figures are derived from two sources—the express books of Wells, Fargo & Co., and the books of the reduction companies. The following are the monthly shipments of Wells, Fargo & Co., from January 1 to December 31, 1868:

| | Ounces. | Value. |
|---|---|---|
| January | 240 | $ 300 00 |
| February | | |
| March | 3,200 | 3,309 00 |
| April | 496 | 482 00 |
| May | 2.288 | 2,669 77 |
| June | 6,160 | 6,255 36 |
| July | 7,024 | 8,580 00 |
| August | 10,688 | 13,286 41 |
| September | 5,920 | 7,900 00 |
| October | 5,008 | 5,600 00 |
| November | 5,184 | 6,585 00 |
| December | 9,280 | 9,120 00 |
| Total | 55,488 | $64,487 54 |

"These figures are, as I am informed, currency values, and represent only the silver bullion shipped from Georgetown. A large amount taken from the mines has been shipped from Central, and will be given in my next communication from that place.

"The following statements are from the various reduction works. From May 3 to December 31, 1868, Huepeden, Wolters & Co. took out the following amounts:

| | Ounces. | Val. in coin. |
|---|---|---|
| May | 2,548 35 | $2,708 70 |
| June | 4,314 99 | 3,237 35 |
| July | 3,472 12 | 4,119 15 |
| August | 7,406 44 | 8,432 38 |
| September | 4,440 68 | 4,960 66 |
| October | 5,094 55 | 5,180 34 |
| November | 4,214 80 | 4,104 22 |
| December | 6,284 35 | 6,053 61 |
| Total | 38,046 28 | $39,191 56 |

The Georgetown Smelting Works, J. T. Herrick, Superintendent, have taken out:

| | Ounces. | Val. in coin. |
|---|---|---|
| For the Company | 20,040 | $26,052 00 |
| For Jos. Watson | 4,044 | 5,257 20 |
| Total | 24,084 | $31,309 20 |

"The furnace of Messrs. Schirmer and Bruckner has taken out 8,312 ounces, coin value, $10,805,60.

"Stewart's reduction works have taken out, 5,218 50-100 ounces, coin value, $5,939.00. The total amount therefore, as reported by the reduction works would be: Ounces, 75,660 78-100; coin value, $87,245.36; currency value, (25 per cent. additional,) $109,056.70.

"The amount shipped by express from the Georgetown office, compares with that taken out by the four reduction works as follows, values stated in currency:

| | Ounces. | Value. |
|---|---|---|
| Taken out by Reduction Works | 75,660 78 | $109,056 70 |
| Shipped by Wells, Fargo & Co., from Georgetown | 55,488 00 | 64,487 54 |
| Excess | 20,172 78 | $44,569 16 |

STATEMENTS CONNECTED WITH THE ABOVE.

"The bullion taken out by Mr. Stewart was the result of fifty days run, on ore from twenty-seven different lodes, in lots of from one to five tons. The total number of tons is not given.

"The bullion from the Georgetown smelting works, I. T. Herrick, Superintendent, was the result of seventy day's run, on one hundred and one tons of ore. The average per ton, therefore, would be $309,99/ in coin. The ores have been first class.

"The number of tons run by Messrs. Schirmer & Bruckner has been sixty-five, of which about twenty-five were used as fluxes, leaving forty tons of ore. They guarantee ninety-five per cent. of the fire assay, the lowest they have ever taken out being ninety-three per cent. The average yield of the forty tons has been $270.14, coin value, per ton.

"Messrs. Hepueden, Wolters & Co., have reduced 447 1-6 tons, which have given a general average of $87.64 coin value per ton. These are second class ores, and the company save eighty per cent. of the assay. In the month of May they ran on poor ores, and worked over considerable refuse stuff. In July they ran only twenty-two days, and in October, only 19 1-2 days, while in November and December the setting up of new machinery interfered considerably with the regular operations of the works. Up to August the capacity of their works was from 2 to 2 1-2 tons in twenty-four hours, but during that month improvements were made in the furnace by which its capacity was increased from 2,000 pounds to 2,500 pounds for a charge, and the general capacity of the works thereby increased to from 2 1-2 to 3 tons per twenty-four hours. In September by additional improvements they increased the charge to 3,000 pounds, and thereby the capacity of the works to from 3 to 3 1-2 tons per twenty-four hours. The roasting of the ore has also been improved by an invention of their own, on which a patent has been applied for. At present the company are putting up a second cylinder with a new engine, etc., by which the capacity of the works will be raised to from six to ten tons of ore per day, according to its nature.

MINING MISCELLANY.

"Quite a large number of lodes are being worked, the weather thus far having been extremely favorable for mining. The Equator, Brown and Baker companies are all carrying on operations, and among the lodes being developed are the Gilpin, McClellan, Argentine, Astor, Terrible, Coin, Snowdrift, Mendota, Lillie, Anglo-Saxon, Griffith, Livermore, Emmet, High Glee, Quaker, Elgin, Magnet, and a few others.

"In East Argentine, the Pine Mining company are running two drifts on the vein of the Belmont lode, one of them being 210 feet deep and the other sixty feet. Good ore is taken out, there being on hand, as Prof. Dibben informs me, about 250 tons. The International company are now opening a lode of the same name, and are running on the vein, one drift being 160 feet deep and the other 60 feet. About 150 tons of ore have been taken out. A fact in connection with these lodes is told me by Prof. Dibben, and that is, that at a depth of 125 feet from the surface of the mountain, the ground is frozen. The ice, which lays between the strata of the rock, is as hard and brittle as glass.

DRESSING WORKS.

"Prof. J. Kurtz has just begun the foundations for the erection of extensive dressing and separating works, about one mile below the town. The company is composed of only four persons, with a capital of $50,000, and propose to erect works after the best known German methods. They have two objects in view—first, to dress the company's ores from the Griffith, Mills County, and other lodes. These lodes contain fine galena ore, mixed with zinc blende and iron and copper pyrites, now nearly unfit for working, but which when dressed will pay a large profit. Second, the company propose to buy ores, dress and separate them, and then re-sell them to the proper reduction works, as the company do not intend to reduce ores. Prof. Kurtz also intends to separate and concentrate sulphuret ores, so that they will pay to amalgamate, which task, if successful, will enable many mines which contain poor ore to be worked profitably.

"As these are the first works of the kind ever commenced in Colorado, it may be proper to speak of the gentleman under whose charge they have been begun. Prof. Kurtz is without doubt the best and most experienced man in the line of dressing ores that we have in Colorado, and probably in the West. This branch of milling has been his special study, and he is besides familiar with the leading works in the Hartz Mountains, and Freiberg, Germany, as well as with those of England. Among the mines of Australia he was eminently successful in erecting works of this kind, and we doubt not that he will achieve the same success here. Of the assistance which these works will be in the reduction of our ores, no word need be written, and that they have fallen into hands so well qualified for the undertaking is a matter of congratulation."

## Nevada.

**White Pine.**—The subject of titles in White Pine is being agitated in the Nevada papers. The Reese River *Reveille*, Jan. 27, has the following:—"How shall the title to deposits of silver ore be determinec? is still an unsettled question. The recent verdict of the jury in Eberhardt vs. Richmond left the question practically where it was before the trial began. Indeed, it is more complicated and befogged. The plaintiffs went into court on the theory that the Eberhardt is a vein: the verdict was based on the fact of a proved connection of ore between a certain point of the works of the company and the Richmond, and priority of location. The regulations of the district of White Pine provide only for the location of veins—true veins; and it is the suggestion of common sense and the plainest equity that the fact of the Eberhardt being a vein should be established beyond doubt. It should be demonstrated. The decision in the case alluded to violates the spirit of the laws of miners—the local regulations of the various districts—and creates an unseemly monopoly on the public domain. The Eberhardt company has no other title than that derived from the regulations of the district; and under the late verdict that title cannot be maintained by their letter and spirit. It seems perfectly clear that the Eberhardt company could not procure a patent for its mine under the Mining Law of Congress in the face of a protest by the Richmond company. It located on a vein; it sought to oust a trespasser on its alleged vein by an appeal to the court; but the jury ignored the claim or pretense of a vein, and rendered a verdict on the actual or supposed connection of ore in a deposit. This is regarded as a serious error, opposed alike to the spirit and tenor of the local regulations of the miners, and repugnant to common sense, justice, and a fair and liberal policy. Now that that trial is passed, one may and should speak freely, to the end that the error may not be repeated. The Eberhardt is not a vein; it lacks all the essential features of a vein; the sensible and honest men among its owners do not now believe it to be a vein, whatever might be their first thought. A score of verdicts from a score of juries; volumes of testimony from vagrant professors and quasi experts; would never transform that palpable deposit of silver ore into a vein. This is as clear to sense as the sun at meridian. These remarks were suggested by the following reflections on the subject in the excellent *Mining and Scientific Press of San Francisco*, of the 23d instant. Under the caption of 'Title to Layer Deposits,' the editor thus cleverly deposits the matter in a nutshell: 'White Pine is much befogged and clouded, possessorily and prospectively, under inky questions of law. The great Eberhardt trial is in progress at Austin, and acute lawyers, duly stimulated by the occasion, are practicing the art of bandying each other's witnesses as lawyers know exceedingly well how to do, where a few millions of dollars are involved. As in the great Comstock trials, at Virginia city, the result depends to a considerable extent on the opinions of geologists and experts. Of these there is no lack, persons ready to express their opinions; and the competent and honest, no less than the partially reliable and the dishonest, are treated in turn to the delicacy of 'eating their own words'—as they had it at Virginia—and more too, with legal sauce. The ores in question being those actually exploited, are generally conceded to be of the nature of layer deposits from infiltration, and belonging to the bog-iron and manganese class, which are, or ought to be, held by their superficial extent, independently of the question of the origin of the metal so deposited. If neither the district mining law, nor the general law, provides for a superficial location—no law existing to fits to the facts of nature in the case—the determining issue seems to recur to the question of how far a defective law is to be followed to the letter, in order to mete out justice, or, in its stead, the intention of general United States and foreign laws and precedents, governing as in the case of bog-iron and placer gold mines; which certainly are, and ought to be, applicable to claims of title by superficial extent."

# COPPER.

## Michigan.

[FROM OUR LAKE SUPERIOR CORRESPONDENT.]

HOW COPPERDOM FEELS UNDER THE NEW TARIFF.

ONTONAGON, MICHIGAN, Feb. 19, 1869.

EDITOR JOURNAL OF MINING:

SIR:—The smoke of cannon and bonfires having cleared away since the rejoicing over the passage of the copper tariff, I write you to say that prospects for the future have improved at least 100 per cent. in this country. Mines that ceased operations months since are again working, others which were in the last throes of expiring breath are becoming quite active, while those that could barely live before are now confident of dividends, for which there was no hope under the old law. Our yearly product for 1868 in this district was several hundred tons less than it had been since 1851, and this falling off would have increased to an alarming extent during the current year had not our National Legislators come to our aid. Our Member of Congress, Hon. JOHN F. DRIGGS, has placed the people of this country under lasting obligations by his indefatigable exertions in behalf of this measure, and as there is much *native American* in our natures, "slow to forgive injuries or forget benefits," he may rely confidently on any favors which copperdom can assist in bestowing. Mr. D. has never been unpopular with our people, though party lines have kept him in the minority at elections, but to-day he could command more votes for almost any office than any Republican in the State, and I probably hazard little in saying more than any man in the State. Strange as it may seem to those unversed in our exact status prior to the passage of the bill, it is nevertheless true that we were on the very verge of universal ruin. Capitalists were abondoning us; for the low price of mineral precluded the possibility of mining it with profit. Full confidence in the capacity of many, *very* many of our mines to pay with reasonable protection against the pauper labor of our principal competitors in the production of copper ores, added to their faith that wiser counsels would prevail in the enactment of this law, is all that has kept us alive for the past two years. Happily for all these hopes, this trust in the wisdom of our rulers has not been disappointed, and we already feel the benefits resulting from their beneficent labors.

How long it will require to recover from the effects of the past mistaken policy time alone can determine, though I think many of our companies, knowing the importance of an early realization of hopes long deferred, will go vigorously to work for this end. Among those in best position for such policy, and most likely to pursue it, I will name the Caledonia, Flint Steel River, Rockland, Victoria, Ridge, Aztec, and last, though not least, the "None Such." As I shall now have somewhat of general and local interest to write of, you may expect to hear from me more frequently.

J. W. C.

We take the following items of interest from the Boston *Commercial Bulletin*, March 6:—"The annual meeting of the Pewabic takes place on the 24th inst., when the stockholders are to be called upon to vote on consolidation with the Concord by giving them one share of Pewabic for five of Concord, or 4,400 shares for the entire property, free of debt and incumbrance. The profits of the Pewabic last year were $19,090 15 and their assets exceeded their liabilities by $66,784 69....The report of the Franklin mine shows a profit for the year of about $32,000, nearly $30,000 of which has been expended upon the stamp mill, which, with the other machinery is now in good order. The ground worked the past year is rich, and continues to improve. The average price of the sales of copper for the year past has been 23 3-4 cents per pound. The balance of assets over liabilities is $58,085,79. During the week the following sales among others of copper stocks have been made at the Boston Stock Board: Copper Falls, 650 shares; Franklin, 899 shares; Pewabic, 700 shares; Quincy, 348 shares; a mere drop in the bucket in amount of sales of former times....The Mississippi & Lake Superior Railroad, which runs from St. Paul to the head of Lake Superior, is to be completed by June 1, 1870, and will reduce the cost of mining on the lake at least one-third. Thirty miles of the road are already finished."

# SLATE.

## Pennsylvania.

SLATINGTON, March 8, 1869.

EDITOR JOURNAL OF MINING:

SIR:—In a letter to the editor of the Bethlehem *Times*, refuting some statements made in that paper recently to the effect that the slate business was overdone, and that the supply was greater than the demand, a correspondent urges the following rather startling statement. He says:

"What are the facts? I will state but one that bears down directly upon this question of demand and supply, but that one is deemed enough to settle the matter. The firm of Wilbur & Co. of Boston, yearly import and sell as many slates as the whole

United States now produce. They cannot import cheaper than they are here produced, but say in a letter to one of our Pennsylvania operators, who asked, why don't you buy here? Answer: 'There is no one who can fill our demands.' There's the secret; we have no supply."

If this be true, it certainly is, as a correspondent stated in your columns three weeks ago, in reviewing the slate trade, sorely afflicted with bad management, but we think that the accuracy of the statements of the *Times'* correspondent may safely be questioned, inasmuch as the imports of slate to this country have never exceeded in any one year since the trade commenced, in 1837, the value of $250,000, while the annual product is found to reach, by careful estimates, a value of over $3,000,000. As to why Wilbur & Co. continue the importing business, I think some other reason more satisfactory could be given. Can any of your readers give the public some light on their operations? C.

[We cannot forbear remarking here that if those who have the best interests of the trade at heart, and have much at stake, would furnish the public, through some widely-circulated and respectable paper, an annual statement of the true condition of the trade, they would, by instructing the great public, indirectly benefit themselves by silencing the alleged calumnies that they say are communicated from time to time to the newspapers—ED.]

The Slatington *News*, published in the heart of the principal slate district of Pennsylvania, has the following remarks on the slate business, which are worthy of perusal. Says the editor:—"An article denouncing slate mining a failure, and asserting that there was a good deal of oil connected with the slate business, is again going the rounds of the newspapers in this valley. It is evident, judging from the whole tenor of the article, that the instigator thereof is scarcely intelligent enough to tell the difference between decayed lime stone and pure slate metal, or a pontoon bridge from the bridge of his own nose, and was himself, no doubt, interested in one of those worthless quarries about which he makes so much ado. That there are some quarries in Northampton which do not now pay a dividend, and scarcely ever will, we admit to be true. They are, however, not half as many as represented by this evidently incautious and finger-burned speculator. He further states that slate quarries in Northampton pay no dividends, with the exception of Chapman's, and that all the money realized in slate mining is made in selling stock. This also is an incorrect statement. There are many others that pay very compensatory dividends. The National Slate Quarry, for instance, paid a dividend of seven per cent. when in operation for the short time of three months. The Heimbach Slate Quarries pay an annual dividend of at least ten per cent., and their net earnings for October and November, in 1868, amounted to nearly $3,000. The Lehigh River Quarry, as well as quite a number of others, pay equally as well. It is generally admitted by practical slate men, that some of these quarries will pay fully as well, if not better, before the lapse of many years, than Chapman's quarry. They give several very plausible reasons for so believing. At some of the quarries in the Upper or Blue Mountain strata, they have inexhaustible beds to operate on, and the slates in this strata split to better advantage, and with less loss of good material. In the Lower or Chapman's strata, blocks of slate can be split one way only. If they take out a block 15 feet long, they are obliged to split it to the thickness of slate for the full length of the block. In the Upper strata blocks of any length or thickness may be split any way, either lengthwise or across, and may be converted into smaller blocks, of almost the same size as the slate which is being made thereof, before taken in the shed. Here they are split to the proper thickness, and afterwards put on the dressing-bench, where the edges are made smooth and square. Besides this advantage, one man can make at least from three to four squares of slate more in a day from this material than from Chapman's. Now, taking these facts into consideration, we cannot see how it is that a man can have the boldness to publicly assert that no quarry in Northampton pays a dividend but Chapman's, and that nearly all the other quarries are worthless. Editors should be a little more cautious in making assertions of this kind, and should at least endeavor to ascertain the truth concerning a matter of so much importance as slate mining and manufacturing has become of late years, before denouncing it as worthless and oily."

## MISCELLANEOUS.

## Michigan and New York.

The Chicago *Republican* has the following interesting accounts, embracing statistics of the salt products of the Saginaw Valley and the Onondagua springs. The alabaster works and plaster works on the west shore of Saginaw bay are also included. It is peculiarly satisfactory to notice the marked improvement in the business of manufacturing salt in the Saginaw valley. Our saline waters are an inexhaustless resource; the product they afford takes away none of the natural wealth of the country, while their development has had the effect to render valuable for staves and heading many varieties of timber of but little worth before, and the immense quantities of fuel consumed in the kettle boiling process in particular, has caused the clearing of thousands of acres of land which is thus being brought rapidly into profitable use for agricultural purposes.

From 1864 to 1866 there was a falling off in the saline product, the number of barrels manufactured in 1866, being 58,359 less than the number manufactured in 1863, even, and 121,076 less than the number manufactured in 1864. In 1867 there was an increase of 66,734 barrels over the product of the previous year and last year, 1868 the product exceeded that of any former year, 26,617 barrels, being the excess over the product of 1864, up to this time the leading year in the salt business.

The following summary of the manufacture of salt since the business was inaugurated is given:

| | Barrels. |
|---|---|
| 1860 | 4,000 |
| 1861 | 125,000 |
| 1862 | 243,000 |
| 1863 | 466,356 |
| 1864 | 529,073 |
| 1865 | 477,200 |
| 1866 | 407,997 |
| 1867 | 474,721 |
| 1868 | 555,690 |

Nine years ago the first barrel of salt was made in the Saginaw Valley.

The Saginaw and Bay Salt Company, which has handled four-fifths of the salt shipped from the Saginaw Valley during the past year has shipped and sold 382,352 barrels, of which 41,360 barrels were home sales. Chicago received and consumed the largest amount, and Cleveland and Toledo next. The company have agents at every port of any consequence on the lakes, and also at inland cities. The amount delivered to the association during the season is as follows:

| | Barrels. |
|---|---|
| First District (Bay county) | 153,141 |
| Second Disirict (part of Carrollton), | 57,990 |
| Third District (Rochester Works to Buffalo Salt Company's Works) | 74,507 |
| Fourth District (all works south of above), | 139,194 |
| Bought by company, | 17,141 |
| Total, | 392,335 |

ONONDAGA SALT SPRINGS.

The Superintendent of the Onondaga Salt Spring reports the quantity inspected during the last fiscal year at eight million seven hundred and ninety-three thusand five hundred and fourteen bushels (8,793,514), being an increase of production over that of the previous fiscal year of two million sixteen thousand four hundred and fifty-four bushels (2,016,454). The amount of revenue received from all sources, was eighty-eight thousand and forty-nine dollars and forty-seven cents ($88,049 47); total expenditures connected with the superintendence of the springs was forty-nine thousand two hundred and thirty-eight dollars ($49,238); the amount of net revenue received by the State being thirty-eighty thousand eight hundred and eleven dollars and forty-seven cents ($38,811 47.)

During the year, an unusually large number of new wells have been put down, and others are contemplated. The total value of the salt production for the year is $1,200,000.

CHLORIDE OF CALCIUM.

Garrigues & Co., of Zilwaukie, manufactured some 70,000 pounds of this substance, now largely used in the manufacture of artificial concrete stone.

PLASTER.

At Alabaster, on the west shore of Saginaw Bay, forty-two miles by course of steamer from the light-house at the mouth of Saginaw river, is located the Alabaster works and plaster beds, belonging to George B. Smith, Esq. Excellent progress has been made in the development of this resource during the past season; an extensive mill for grinding and calcining has been erected, barrel works put up, and great additions made to the dock and storage capacity. The facilities for handling plaster are such that 600 tons can be put on shipboard every twenty-four hours. During the seasons of 1866 and 1867, there was shipped from Alabaster, about ten thousand tons of plaster rock. The shipment for 1868 are as follows:

| | |
|---|---|
| Rock plaster,(tons) | 25,000 |
| Ground plaster (tons) for land | 2,000 |
| Ground plaster, (barrels) for land | 10,000 |
| Calcined plaster (barrels) for land | 5,000 |

The barrels used are all manufactured on the premises, and a small saw-mill which cut, last year, 500,000 feet, is run solely to furnish lumber for the use of the works. Capital invested, $250,000. The quarry is probably the most extensive single deposit in this country.

The beds examined show an extent of 450 acres, and are so elevated above the bay that the water is drained off without difficulty; they are encumbered by only an average of five feet of earth on the surface, and have, as far as excavated, an average depth of eleven and one half feet. Below this is a stratum of black slate overlaid by four inches of building stone, containing fossils of marine fauna of new species and very interesting to geologists; below this is another plaster bed, twelve feet in thickness, and from the dip of the beds as they recede from the shore, it is probable the intervening shales will run out, leaving the plaster in one unbroken layer of over twenty feet in thickness.

## Iowa.

COAL, MARBLE AND GYPSUM.

FORT DODGE, IOWA, March 2, 1869.

EDITOR JOURNAL OF MINING:

SIR:—The glitter of the mines of the Far West has blinded capitalists and made them forgetful of places in the older States, like Iowa, which, reckoning by Western advancement, would be supposed to be too old to have anything new found in it. Such, however, is not the case. Only a year or two ago it was supposed that there were no beds of coal near here which were more than about three feet in thickness, but as the demand for coal has increased, more energy has been displayed in looking for it, and several important mines have been discovered this winter, one with a vein of excellent coal six feet thick.

A quarry of beautiful marble, nearly, if not quite equal to the Vermont marble, has recently been opened here, and when this place is connected by railroad with the rest of the world—and it is expected it will be in six months—quite a fortune will be added to Fort Dodge. Besides, marble is used here in great quantities, but it will, however, have to compete with our vast gypsum quarries, which furnish a handsome stone that can be cut into building blocks as easily as chalk.

This gypsum deposit will average, according to the statement of Dr. WHITE, the State Geologist, about twenty-seven feet in thickness for a distance on the Des Moines Rives of about seven miles, coming boldly out in massive walls. OSCAR I. STRONG.

## Scientific Meetings.

### CALIFORNIA ACADEMY OF NATURAL SCIENCES.

The proceedings at a recent meeting of this Society, were very interesting. Donations were received of petrified wood from a mine near Grass Valley, presented by T. A. MUDGE, and of a suit of armor worn by the natives of Alaska, before the immigration of the Russians. H. G. HANKS, who has recently returned from an extensive scientific exploration of the mining regions of Southern California, was introduced and read an interesting paper on the mineral resources of those districts, and exhibited some marvellously rich specimens thence, out of a collection of two or three hundred he brought with him. Mr. HANKS' explorations were carried, not only into the mining regions, more familiarly known as Montgomery, Blind Springs, Inyo, Russ, Kearsarge, Coso, Alabama, Telescope, Slate Range, Argus, Salt Spring, Washington and other districts, but also into the great and almost unknown country west of the Sierras in Southern Nevada and Northern Arizona, whence many valuable specimens were obtained. Some of these were labeled as assaying equal to the White Pine marvels, and were they located there, they would be held at unheard of prices. The report referred more particularly to the Inyo District, Death Valley, and particularly to the Gun Sight lead, the first silver lode found in California of which any record exists. He stated that an emigrant party in 1849 came in and reported having seen fabulously rich silver mines on their way, and brought in specimens of pure silver. In 1850, Dr. French, at the head of a party went out to hunt for it, but unsuccessfully, and it has existed in story ever since. The finest specimens exhibited by Mr. HANKS were of argentiferous galena, tetrahedride, kerargyrite, stromeyerite and molybdate of lead. There was also a large and rich specimens of partrite. These specimens are all rich in silver and gold. There are also many remarkably fine specimens from the unexplored regions east of the Sierra. Some from the Montgomery District at the northern end of Owens River, are fahl ores and antimonial and chloride of silver, and show an abundance of the free metal. Mr. HANKS has shown by these specimens that an immensely rich mining country remains yet to be explored and open to American adventurers.

Dr. GIBBONS made an interesting statement in relation to the swelling and shrinking of adobe land under the influence of rain and drouth, its effect upon buildings, and observed that cracks in walls thus caused were often erroneously attributed to earthquakes.

GREGORY YALE called the attention of the Academy to the great need of having a good observatory on this coast, which, he said, should be located in San Francisco. It should be the duty of the society to promote such an establishment.

Dr. COOPER remarked, that Lieutenant Davidson, of the United States Coast Survey, intended soon to establish one here, the telescope for which was now being adjusted.

## Manufacturing and Mechanical Notes

### NO. XLVII.

### Norwalk and its Manufactures.

There are but few of our readers who have not heard of Norwalk. The terrible railroad catastrophe which occurred in its vicinity a few years ago has indelibly impressed the name on the minds of the community. But there are other things besides railroad accidents for which Norwalk deserves to be known and remembered. Beautifully situated on a salt water estuary, close to Long Island Sound, it possesses excellent advantages for doing business, as it has most convenient connection both by rail and water with the great markets of the country.

The old town of Norwalk has the usual characteristics of a country village; in this case, however, combined with interesting historical associations, as it had the honor of being burned by the British under Gov. TRYON, on the 17th of July, 1779. South Norwalk, which extends along the shores of the bay, is connected with the old town by means of a horse railroad. Norwalk is noted for its manufactures of Hats, Carpets, Locks, Shoes, Blinds, and also for its extensive Iron Works, in which are constructed Steam Engines, Steam Pumps and Fire Engines; Air and Vacuum Pumps, Steam and Blowing Engines; Pumping Engines for water works, as well as Mining, Wrecking and Supply Pumps. The Norwalk Iron Works, of which E. HILL, Esq., is President, are favorably known wherever well-made engines and carefully-constructed pumps are employed, and the list of their customers shows names as familiar as household words to those acquainted with our great manufacturing interests. Under the careful and efficient management of the Secretary, E. J. HILL, and the Treasurer, C. H. WARING, every precaution is taken to prevent any inferior work from leaving the establishment. Everything is carefully tested before it leaves the shop, and unless the character of the work comes up to the required standard it is condemned without scruple.

Norwalk Locks are also well known throughout the country, being noted for excellence of material and perfection of workmanship. Of the company which manufactures these, Mr. E. HILL is also President.

On the whole, Norwalk is a pleasant example of a thriving New England manufacturing town.

## All Sorts.

☞ The general railroad bill, so called, now before the New York Legislature, it is said, is likely to pass even over the Governor's veto. It provides that whenever any railroad company duly organized under the laws of the State shall, within two years from the passage of the act, complete and put in running order twenty or more continuous miles of railroad in any part of the State, the said company shall receive from the State Treasury, from the general fund, $4,000 per mile for each mile so constructed, to be paid on the certificate of the State Engineer and Surveyor that the road is in good running order. If the bill becomes a law, sixteen roads will partake of its benefits, to the aggregate amount of $3,860,000.

☞ The untimbered surface of the plains between the Mississippi and the Pacific amounts to fourteen hundred thousand square miles, and it is asserted that, by a little artificial effort, forests may be gradually extended over this large area. Experiments thus far made have proved successful. Trees to the number of millions have been produced from the seed of almost every forest species by the unaided efforts of a single association in Nebraska.

☞ "What's that?" asked Mrs. Partington, looking up at the column of the Place Vendome during her late visit to Paris. "The pillar of Napoleon," she was answered. "Well, I never did!" she exclaimed; "and that's his pillow—he was a great man to use that! But it's more like a bolster. And it's made of iron, I do believe. Ah, Isaac! see what it is to be great. How hard his head must have rested on his ironical pillow!"

☞ The Mormons had an execution recently. The criminal was brought, ironed, into the court-yard, where there was a crowd of some four hundred persons, and seated in a chair. He then read aloud from a chapter in the New Testament, the irons were taken off his hands, and at a signal from the sheriff he was instantly shot dead.

☞ The following is the recipe for Indian pudding in Fort Dodge: First, catch your Indians—two of them; boil till their heels come to the top; let stand in a cool place for two weeks; then serve with sorghum and vinegar.

☞ The highest permanent human habitation on the face of the globe is the Budhist monastery of Hanle, in Thibet, at a height of 15,117 feet above the sea.

☞ When you promise to do a thing, be sure and keep your word, as well for the sake of truth as in justice to others.

☞ Cork trees are being raised in Florida from seed procured from Portugal.

☞ Chicago is talking about an elevated railway for that city.

☞ The Chinese call California the Golden Mountain.

## MARKET REVIEW.

Friday Evening, March 12, 1869.

**Gold and Silver Stocks.**—Combination Silver is now reported at $3 00. Consolidated Gregory continues to gain in strength. Sales were made to-day as high as $2 70—but Smith and Parmelee is again somewhat depressed, and lower. Upon the whole, there is more activity in the Mining Stock Market. The following is the circular of the New York Petroleum and Mining Stock Board:

| | Bid. | Asked. | | Bid. | Asked. |
|---|---|---|---|---|---|
| Alameda Silver | .. | | Kipp & Buell Gold | .. | |
| American Flag | .. | .. | La Crosse Gold | 15 | 20 |
| Bates & Baxter Gold | .. | .. | Liberty Gold | .. 1 | 3 |
| Benton Gold | .. | | Manhattan Silver | 35 00 | |
| Bobtail Gold | .. | .. | Midas Silver | | |
| Black Hawk Gold | .. | | Montana Gold | 37 | 38 |
| Consolidated Gregory | 2 55 | 2 70 | New York | | |
| Edgehill Mining | 2 50 | | Nye Gold | .. | |
| Gold Hill | .. | .. | Owyhee Mining | 15 00 | 25 00 |
| Gunnell Gold | .. | .. | People's G. & S. of Cal | .. 5 | |
| Grass Valley | 62 | 65 | Quartz Hill | 75 | 80 |
| Hamilton G. & S. B. | .. | .. | Rocky Mountain Gold | 6 | .. 8 |
| Holman | .. | 6 | Smith & Parmlee Gold | 1 40 | 1 45 |
| Hope Gold | .. | .. | Texas Gold | .. | |
| Twin River Silver | | | Corydon | .. | 15 |
| Gunnell Union | .. | .. | Symonds Fork Gold | | |
| Combination Silver | 3 00 | .... | N. Y. & Eldorado | | .. |
| Sensenderfer | .... | .... | Mariposa | 15¼ | 15½ |
| Quicksilver | 24¼ | 24½ | Mariposa preferred | 85¼ | 84½ |
| Atlantic and Pacific | | | Eagle Gold | | |

**Copper Stocks.**—Central is held at $35 00; and $3 00 is offered for Flint Steel River. At Boston, to-day, prices have ruled as follows.

| | | | |
|---|---|---|---|
| Copper Falls | 14 | Quincy | 37 |
| Franklin | 21 | Cary Improvement | 8¼ |
| Hancock | 5½ | Hecla | .. |
| Minnesota | 2¼ | Bos. Hart. & Erie R. R. | 25½ |
| Calumet | 50 | Isle Royal | .. |
| Water Power | 18½ | | |

**Petroleum Stocks**—Buchanan Farm sells at 55 cents. Other stocks are thus quoted.

| | Bid. | Asked. | | Bid. | Asked. |
|---|---|---|---|---|---|
| Bennehoff Run | .. | .. | Rynd Farm | 10 | |
| Brevoort | 1 00 | .... | United Pet. Farms | .. 10 | 20 |
| Buchanan Farm | .. | | Union | .. | .. |
| Central | 75 | 85 | United States | 1 10 | 1 50 |
| Clinton Oil | .... | .... | Sherman & Barnsdale | .. | .. |
| National | 3 00 | 3 50 | Second National | .. .. | .. .. |
| N. Y. and Alleghany | .. 50 | 1 00 | Bliven | .. .. | .. .. |
| Pithole Creek | 1 30 | 1 40 | Rathbone | .. | .. .. |
| Home Petroleum | | .... | Northern Light | .. .. | .. |
| Pacific Oil | .. .. | .... | Bergen Coal and Oil | .. | .. |

**Miscellaneous Stocks.**—Western Union Telegraph is quoted at 37¼@27½; Mariposa Pf., 33½; Adams Ex., 62½; Wells F. Ex., 31½; Merch. U. Ex., 16½; Lake Shore R., 105; N. Y. Central R., 158½@159½; Reading, 91@91½; Mich. Cen., 128; Chi. & N. W., 82½; Chi. & N. W. Pf., 89½; Clev. & Tol. R., 105; Mil. & St. Paul, 64½@66; Mil. & St. P. Pf., 76½; D. & Sioux C. R., 112; Ohio & Miss., 33; Chi. & Alton Pf., 156½; P. Ft. W. & Chi., 116½; M. S. & N. I., 95½; Clev. C. & Indiana Railroad, 111½; New Jersey Central Railroad, 110½.

**State, R. R. and Other Bonds.**—Tenn St 6's, ex. cpn., are quoted at 65½; N. Car. St. 6's, new, 59½; Missouri 6's, 88@88½; Louisiana 6's, Lever Bonds, 71; Vir. S. 6's, R., 51½; Mich. S. 2d M., 93½; G. West. 2d, 79; Tol. & Wab. 1st ext'd, 90@90½; C. & R. I. & P. P. R. 7.3, 94½; Clev. & Tol. S. F. Bonds, 99½; C. & N. W. con. bds., 96½; Col. C. & Ind. Cen. 1st., 83½; Am. Exchange Bank, 118.

**Government Bonds.**—United States Bonds show again a strong upward tendency in prices. The market has been favorably affected by the completion of the Cabinet, and the appointment to the Treasury of Mr. Boutwell. There has been quite an active borrowing demand for bonds, on terms more favorable to the lenders; some large holders decline to lend anything otherwise than "flat."

| | | | |
|---|---|---|---|
| U. S. 6s, 1881, coupon | 116¼@116½ | U S 5-20s, '65, new coup. | 113 113¼ |
| U. S. 5-20s, 1862, coupon | 119¼ 120 | U. S. 5-20s, 1867, coupon | 113 113¼ |
| U. S. 5-20s, 1864, coupon | 114¼ 115 | U. S. 5-20s, 1868, coupon | 112¼ 113¼ |
| U. S. 5-20s, 1865, coupon | 117 117½ | U. S. 10-40s, ex. coupon | 105½ 105¾ |
| Pacific R. R. 6 per ct. bds. | 101½ 71½ | | |

**Foreign Exchange.**—Foreign exchange is dull and rates rather weak, at the following prices.

| | | | |
|---|---|---|---|
| Lon. (pr. bks), 60 dys | 108½@109 | Swiss | 5.20 5.18¾ |
| Lon. (pr. bks'), sight | 109½ 109¾ | Hamburg | 36 36¼ |
| London, prime com. | 108⅝ 108¾ | Amsterdam (bankers') | 40¼ 40⅜ |
| Paris (bankers'), long | 5.18¾ 5.17½ | Frankfort (bankers') | 40¼ 40⅜ |
| Paris (bankers'), short | 5.15¼ 5.15 | Bremen (bankers') | 78½ 78¾ |
| Antwerp | 5 20 5.18¾ | Berlin (bankers') | 71¼ 71½ |

**Gold.**—Gold has been weak, under the advance of bonds abroad and the quiet in exchange, the prices having ranged at 131¼@131½. The following are the quotations for other coin.

| | |
|---|---|
| American silver | 95 @ 95½ |
| Mexican dollars | 103½@104 |
| English silver | 480 @485 |
| Five francs | 95½@ 96½ |
| English sovereigns | 486 @489 |
| Twenty francs | 384 @386 |
| Thalers | 70½@ 71 |

The money market shows a steady gain in confidence.

The Brokers have still to pay, generally, 7 per cent. on all loans upon stocks, but on Government collaterals there is no difficulty in getting money at 6 per cent.

Discounts are quiet; there is an abundant supply of paper, but few buyers; prime paper continues at 8@10 per cent.

**Petroleum.**—For crude, in bulk, the demand is light and prices are unchanged. We quote at 19c. For Refined standard white there is rather more inquiry, at the concessions. The business is mostly speculative, including 5,000 bbls. on the spot, at 35c.; 1,000 bbls for May, June and July, at 35¼c., and 2,000 bbls. from April to July, at 35½c. For Philadelphia delivery 9,000 bbls. standard white, from April to December, at 36½c. We quote at 34½c. for March delivery; 3,000 bbls. Crude, at the Creek, were sold, seller's option, April, at $6.

| | | |
|---|---|---|
| Receipts for the week ending March 9 | pkgs | 13,998 |
| Exports for the week ending March 9 | galls. | 734,970 |
| Exports from Jan. 1 | galls. | 7,746,040 |
| Exports same time last year | galls. | 7,575,024 |

The following is the quantity exported from other ports, Jan. 1 to March 6.

| | 1869. | 1968. |
|---|---|---|
| From Boston, galls. | 536,439 | 418,260 |
| Philadelphia | 3,454,032 | 3,568,985 |
| Baltimore | 73,654 | 203,155 |
| Portland | .... | 6,800 |
| Cleveland | .... | .... |
| Total | 4,061,125 | 4,199,200 |
| Total exports from the United States | 12,115,233 | 11,835,963 |
| Same time in 1867 | | 7,025,889 |
| Same time in 1866 | | 9,762,291 |

**Copper** was very dull and without large transactions until yesterday, when from 500,000 to 900,000 pounds of Lake Superior was sold at 26@26½. A larger business is reported, but the details have not transpired.

The English market declined to £72 for Chili Bars.

**Tin** is without transactions. Sheets 32½c; Banca 33c.; English 31c.

The English market is unchanged at 127s for Sheets.

**Spelter** is dull, with a jobbing business only at 6½c. gold, for Silesian.

**Lead**—$6 25 to $6 37½ for ordinary foreign, with sales of 300 tons at $6 30.

**Cement**—Rosendale continues firm at $2,50, cash.

## THE IRON TRADE.

New York, March 12, 1869.

The demand for Scotch Pig continues to be moderate. Prices remain firm, with a small stock and light arrivals. The sales are 50 tons Glengarnock, ex. ship, at $42; 50 do. from yard, $43; 200 do. Gartsherrie, to arrive, $42 to Dealers, and $43, in lots, to consumers; and 200 do. English to arrive, $40. American is in more active request, and there has been a considerable movement in Hudson—say about 16,000 tons, season delivery, at $40 for No. 1, and $38 for No. 2. In other brands the business has been small, for reasons previously noted, but prices are well supported at $42 for No. 1 ex., and $40 for No. 2, being the nearest quotations. We notice a sals of 100 tons Old Rails at $16 25; and 150 do. Scrap to arrive, on private terms. Bar from store is without much animation, though in little better request at old rates.

Import, from Jan. 1 to Feb. 28, 1869.

| | Bar, Tons. | Pig, Tons. | Sheet, Bdls. |
|---|---|---|---|
| From Foreign Ports | 1,376 | 5,778 | 63,285 |
| Coastwise ports | .... | .... | 26 |
| Total | 1,376 | 5,778 | 63,315 |
| Same time 1868 | 1,282 | 3,385 | 15,589 |

Boston, March 6, 1869.

The market for Pig Iron, says the *Commercial Bulletin*, is very firm at the advance last noted. The choice brands of foreign are in small stock, though the demand is quite moderate, and in default of further prospective supplies, holders are indifferent as to sales. American Pig continues excited, with the demand ahead of the supply, and prices continue to advance.

In New York, large contracts for forwarded delivery have been made at $42 per ton for No. 1, and at the close, some makers are inclined to withdraw from the market. A large portion of the next season's production has been already sold to large dealers and speculators, and these latter are holding at extra rates. Whether their anticipations of large profits will be realized, must, of course, depend upon the course of Federal legislation and the consumptive requirement for manufactured products.

Manufactured iron, of most descriptions, is in moderate demand; but prices are very firm in view of the upward tendency of pig metal. Bar and sheet are a shade firmer. Hardware is improving, with considerable sales for Southern and Western shipment. Railroad iron and building materials continue in good demand. Boiler plates and machinery are in fair request.

Scotch Pig is firm, with small sales of Gartsherrie and other brands No. 1 in lots for consumption, at $42@$46 ₽ ton, the outside rate for Coltness. American is active and advancing with sales of retail lots at $42@$47 00 ₽ ton, for the different numbers. Charcoal Pig is selling at $50@$60 ₽ ton, as to brand. Bar Iron is firm and tending up, with sales of English and American, from store, at $87@$90 ₽ ton for common, and $93@$95 for refined. Rails are firm and in steady demand, with sales at $54@$55 ₽ ton, gold, for English, and $81@$82 ₽ ton, currency, for American. Cast Steel is selling at 18@23c. ₽ ℔ for English, and 21@23c. for American. Anchors are selling at 8@8½c. ₽ ℔; Chain Cables, (¼@2 inches thick), 8@7½c. ₽ ℔; Coil Chains, (¼@1½ inches thick), 12@8½c. ₽ ℔. Boiler Plates are selling at 7½c. for flanges, 5½c. for C No. 1, and 5½c. ₽ ℔ for common and tank. Russia Sheet is in reduced stock and firmer, with sales at 11¼@13½c., gold, as to number. English and American do. is quiet and selling at 7¼@9c. ₽ ℔. Nails are quiet and steady, with sales at 5c. ₽ ℔ for assorted sizes. Old Iron is scarce and wanted, at $1 40@$1 65 ₽ 100 ℔s for Cast, and $2@2 10 for Wrought Scrap.

### Lehigh Valley Iron Trade.

Pig Iron transported by the Lehigh Valley Railroad Co. for the week ending March 6, 1869:

| From | Tons. | Total. |
|---|---|---|
| Carbon Iron do | 240 | 9,650 |
| Lehigh Valley Iron Co | 255 | 11,380 |
| Thomas Iron do | 760 | 38,915 |
| Lehigh Crane Iron do | 910 | 34,660 |
| Allentown Iron do | 400 | 36,580 |
| Robert Iron do | 310 | 11,735 |
| Glendon Iron do | 620 | 28,364 |
| Other Shippers | 1220 | 24,055 |
| Total | 4,715 | 195,789 |

### Market Prices.

New York, March 12, 1869.

Duty.—Bars, 1 to 1¼c. per lb.; railroad, 60c. per 100 lbs.; boiler and plate: 1¼c. per lb.; sheet, band, hoop and scroll, 1¼ to 1¾c. per lb.; pig, $9 per ton, polished sheet, 3c. per lb. Payable in gold.

| | | | | | | |
|---|---|---|---|---|---|---|
| Am. pig, fy. No 1, best, | $40 00 | @43 00 | | Bar, Swedes, ord'y sizes | — — | 145 00 |
| " " 2x frdy, | 38 00 | 40 0 | | Bar, Eng. and Am., rf'd. | 90 00 | |
| " Grey Forge | 36 00 | 38 00 | | Bar, Eng. & Am., com. | 85 00 | 87 50 |
| White and Mottled | 32 00 | 35 00 | | Scroll | 125 00 | 160 00 |
| Pure white for Cal. mar. | 32 50 | — — | | Ovals and half round | 122 50 | 150 00 |
| Scotch Pig, No. I, best bd | 40 00 | 42 00 | | Band | 125 00 | — — |
| " " " outside, | 40 00 | — — | | Horse Shoe | 125 00 | — — |
| Wt. No. 1 Scrap f'm yd. | .... | 50 00 | | Rods, ⅛@8-16 inch | 100 00 | 160 00 |
| Ex ship | 45 00 | .... | | Hoop | 185 00 | 185 00 |
| Bar, Ref., En. & Am. | 90 00 | 95 00 | | Nail Rod, per lb | 8¼ | 10 |
| Bar, Sw's, as. sizes, gold | 82 50 | 87 50 | | Sheet, Rus. as'd. Nos. (gold) | 11¼ | 13 |
| Old Rails | 47 00 | .... | | Sheet, s'gle. D. & T. com | 5½ | 7 |
| R. R. Iron, For., f'm Stock gold | 54 50 | 55 50 | | Rails, Eng., gold, ton. | 55 00 | 56 00 |
| R. R. Iron For., to imp. | 55 50 | 60 00 | | Rails, American | 74 00 | 76 00 |
| " " Amer. at wks. currency | 76 50 | — — | | STEEL. | | |
| R. R. Iron, Am., deliv'd | 80 00 | 81 00 | | English, cast 2d & 1st qual. | 18 | @22 |
| Stl rails of any pattern at works, currency | .... | | | Eng. Spring 2d & 1st qual | 9 | 11¼ |
| Solid Steel rls. For., gd. | 95 — | — — | | Eng. Blister 2d & 1st qual. | 11¼ | 19 |
| Street Rails at works | 85 00 | — — | | English Machinery | 12¼ | 15 |
| Light rls. for mines &c. at works | $85 00@ | — — | | Eng German 2d & 3d qual. | 14 | 16 |
| Do. delivered here | .... | — — | | Am. Blister, "Black Diam'd," | 10¼ | 16 |
| | | | | American, Cast, Tool " | 19 | — |
| | | | | American, Spring " | 10 | 13 |
| | | | | American Machinery " | — | 13 |
| | | | | American German " | 10 | 13 |

Philadelphia, March 10, 1869.

Messrs. Ralston & Matthews report as follows:

"The market for iron, especially pig, has been quite active. We note sales during the past three weeks, for delivery during the season, of some 90,000 tons, at prices ranging from $40@$42 for No. 1 Foundry, and $38@$40 for No. 2; Gray Forge has been sold at $38 for irons made on the Lehigh—Schuylkill irons generally ranging at $2 per ton under those made on the Le high. In rails we hear of sales made for future delivery, but orders are wanted for immediate make. In sheet iron the Pittsburgh manufactures appear to have conttrol of the Eastern market, having sold largely in New York at from 5c@5½c per ℔. We learn also that the supply of iron in the West will be short, and, in fact, we think the supply in the country generally will be short."

Pittsburgh, March 6, 1869.

The transactions in raw irons, says the *Commercial*, show a material falling off in sales as compared with the previous week. The cold weather and the sudden decline in the stage of water in the Ohio have delayed a large amount of iron due by that route.

Bituminous coal smelted descriptions are in a great measure restricted for want of transportation facilities to a volume barely sufficient to meet current wants of consumers. Prices remain unaltered, with a fair inquiry.

Anthracite irons are steady, with a moderate inquiry, at prices that were current at the date of our last report.

Stocks of charcoal irons, although not large, are well assorted, and with a fairly active demand, prices are steady.

Fine charcoal blooms are in better request, and all good lots offering are taken up at full rates.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORES.

| | |
|---|---|
| 100 tons Open Gray Forge | $39 00—4 mos |
| 100 tons Common Gray Forge | 38 50—4 mos |
| 100 tons Common Gray Forge | 38 50—4 mos |
| 50 tons No. 1 Foundry | 40 00—4 mos |
| 150 tons No. 1 Foundry | 40 00—6 mos |
| 100 tons No. 1 Foundry, mixed with Native Ore | 41 00—5 mos |
| 80 tons No. 1 Foundry | 40 00—4 mos |
| 80 tons No 1 Foundry | 40 00—4 mos |
| 20 tons No. 1 Foundry | 40 00—4 mos |

ANTHRACITE.

| | |
|---|---|
| 100 tons No. 3 C Short | 40 00—4 mos |
| 50 tons No. 1 Anthracite | 43 00—5 mos |
| 20 tons No. 2 Anthracite | 41 00—5 mos |
| 70 tons Neutral Forge | 40 00—5 mos |
| 10 tons No. 1 Foundry | 44 00—4 mos |
| 10 tons No. 2 Foundry | 42 50—5 mos |
| 100 tons No. 2 Neutral Forge | 40 00—cash |
| 50 tons No. 2 Neutral Forge | 42 00—5 mos |
| 30 tons No. 2 Neutral Forge | 42 00—4 mos |

ALLEGHENY COKE.

| | |
|---|---|
| 100 tons Red Bank | 38 00—6 mos |

Ironton, Ohio, March 4, 1869.

The little metal that there is in the hands of the furnacemen, says the *Register*, is held at advanced rates. The feeling is general that the limits of the advance have not yet been attained, and that, on all brands, there will be a further material rise in rates. We quote this week:

| | |
|---|---|
| Foundry, No. 1 Hot Blast | $43 00@ 43 50 |
| Foundry, No. 2 Hot Blast | 41 00 42 50 |
| Mill | 39 00@ 40 00 |
| Cold Blast | 55 00 60 00 |

The amount of mill iron in the market is exceedingly limited. We note a sale 300 tons, 6 months, at $40.

The best authorities in the trade are of the opinion that there will be no decline this summer, but that present or higher prices will be fully maintained. The only circumstance that we can now discover is, the fact that a vast amount of metal has been bought up by speculators, and all of it, so bought, will be again upon the market. The speculative demand in the East has certainly had an immense influence in reducing the stock in the market. And yet, while we are not ignorant that the West will be relieved from any serious affliction arising from this unhealthy state of the Eastern market, and that the Western trade hangs on its own peculiar circumstances, there certainly will be some sympathy in the metal trade, with whatever disorders may arise in the East. It is hoped that the calamities which might accrue on the Eastern situation could fall on the speculators and those producers who have furnished them with stocks.

Bar iron is in most excellent demand—the production being rapidly taken up. Hoop has orders ahead. Rates for bar 3½@4¼c.

## THE COAL TRADE.

New York, March 12, 1869.

Wholesale.—Nothing definite relative to the various committees alluded to in our last issue has transpired. The probability is that we shall be able to lay before our readers next week a report in full of the labor of these bodies.

There has been a fair demand for coal during the past week, and dealers generally note an average trade.

Prices remain unchanged until the rates of transportation are promulgated by the various companies.

The cold weather has debarred the canals from opening on the 10th inst., as was intended. We understand that the Morris Canal will open for business on Monday next.

The shipments by the different routes of transportation to tide-water note an increase for the week of 77,336 tons compared with same time last year, and for the season thus far 359,649 00 tons. If the shipments continue to increase for any length of time, in the same ratio as they have during the past month, we may expect another break in prices.

Freights remain unchanged—perhaps they may be quoted a shade firmer. Vessels are in good supply.

Retail.—The cold snap has brought a lively trade for retailers in the cities, and the principal business of the wholesale trade for the past week has been in filling their orders. Stove coal is bringing from $6 50 to $8.

The general good management of the Wilkesbarre Coal & Iron Company under Mr. Parish as President and Wm. H. Tillinghast as Secretary, and the care taken in the preparation of their various sizes of coal, has made Wilkesbarre coal one of the most popular kinds in the market.

Baltimore, March 11, 1869.

Stocks on hand only nominal. Trade good since the last cold snap, and prices firmer.

Philadelphia, March 10, 1869.

Trade is becoming more brisk in some grades of coal. The Eastern trade is beginning to realize the fact that prices have reached the lowest point. Some parties have sold coal at lower prices than quoted, finding it necessary to move their coal from the piers. Old stock coal has also been sold at lower prices. These prices, however, should not be regarded as prices for freshmined coal. The Reading Railroad have not fixed their drawbacks yet, but will probably do so next week. The Vessel Owers' and Captains' Association have fixed their rates to Boston at $2 50, and $2 to Rhode Island. Vessels are in good supply,

Wilkesbarre, Pa., March 8, 1869.

Editor Journal of Mining:

Thos. Parish, Esq., and Gen. Ell have disposed of their interest in Pine Ridge Colliery near Wilksbarre, to Messrs. Thomas & Co. of Catasanqua. The figure is reported to have been at a valuation of $280,000 or $290,000 for the property. As it is only a lease, some idea may be formed from this of the value of coal property in this region.

A company has been formed in Wilkesbarre to manufacture gun and blasting powder by Gen. P. A. Oliver's patents. The persons getting up the company are among our most permanent coal operators. The powder has a very good name among those who have used it here. O.

The following table exhibits the amount of Coal that was passed over the various routes of transportation from the Pennsylvania Coal districts for the week ending March 6, 1869, and for the season to that date. A comparison is also made with the amount transported the corresponding week in 1868, showing the increase or decrease, as the case may be:

| | 1868. | | 1869. | | Inc. or Dec. | |
|---|---|---|---|---|---|---|
| Companies, | Week. | Total. | Week. | Total. | Week. | Year. |
| Phil. & Read. R. R. | 26,837 | 498,656 | 36,954 | 494,353 | ↑ 10,117 | ↓ 697 |
| *Schuylkill Canal | .... | .... | .... | .... | .... | .... |
| Lehigh Valley R. R | 19,181 | 462,919 | 37,101 | 525,702 | ↑ 17,919 | ↑ 62,783 |
| Lehigh & Sus. R. R | 3,546 | 43,797 | 14,201 | 159,322 | ↑ 10,655 | ↑ 115,525 |
| *Lehigh Canal | .... | .... | .... | .... | .... | .... |
| Scranton North | 1,749 | 69,635 | 9,978 | 88,685 | ↑ 8,229 | ↑ 19,050 |
| Scranton South | 7,972 | 175,498 | 28,103 | 269,061 | ↑ 20,131 | ↑ 93,563 |
| Penn. Coal Co. rail. | 8,068 | 84,928 | 9,907 | 135,878 | ↑ 6,854 | ↑ 50,950 |
| *Penn. Coal Co. can. | .... | .... | .... | .... | .... | .... |
| *Del. & Hud'n Can. | .... | .... | .... | .... | .... | .... |
| Shamokin | 6,166 | 57,826 | 5,866 | 59,354 | ↓ 799 | ↑ 1,527 |
| Trevorton | 565 | 3,060 | 699 | 2,991 | ↓ 466 | ↓ 1,069 |
| Short Mountain | 541 | 5,891 | 1,403 | 5,758 | ↓ 503 | ↓ 133 |
| Lykens Valley Co. | 1,308 | 14,594 | 1,123 | 6,393 | ↓ 185 | ↓ 8,201 |
| Hunt'g'n & B'd Tp | 3,215 | 23,058 | 5,422 | 52,041 | ↑ 2,207 | ↑ 28,983 |
| *Wyoming South. | .... | .... | .... | .... | .... | .... |
| *Wyoming North. | .... | .... | .... | .... | .... | .... |
| Williamstown Col. | 1,261 | 20,336 | 3,433 | 27,509 | ↑ 3,171 | ↑ 973 |
| Total | 75,394 | 1,455,193 | 152,730 | 1,814,842 | | |
| 1868 | | | 75,394 | 1,455,193 | | |
| | | | ↑ 77,336 | ↑ 359,649 | | |

*Closed.

### Report of Coal Transported over Lehigh Valley Railroad

For the week ending March 6th, 1869, and previously this season, compared with same time last year:

| Where shipped from. | Week. Tons. Cwt. | Total. Tons. Cwt |
|---|---|---|
| WYOMING REGION. | | |
| Franklin Coal Co | 430 10 | 13,896 13 |
| Audenried | .... | .... |
| Lehigh and Susquehanna | .... | .... |
| Germania Co | .... | .... |
| Wilkesbarre Coal & Iron Co | .... | 595 15 |
| Warrior Run | 405 08 | 4,763 06 |
| Parrish & Thomas | 31 07 | 3,010 16 |
| New Jersey | 229 08 | 3,658 18 |
| Union Coal Co | .... | .... |
| Wyoming Coal & Transportation Co | 29 19 | 10,989 03 |
| Newport Coal Co | .... | .... |
| Morris & Essex Mutual Coal Co | .... | .... |
| Consumers | .... | .... |
| Everhart Coal Co | .... | .... |
| Plymouth Coal Co | .... | .... |
| Hillman & Son | 136 03 | 4,651 00 |
| Bowkley, P & Co | | 44 18 |
| Mineral Spring | 301 06 | 7,931 14 |
| Valley Coal Co | .... | .... |
| Enterprise Colliery | 1,494 10 | 21,599 14 |
| Burroughs | 289 09 | 8,771 14 |
| Washington Coal Co | .... | .... |
| West Pittston | .... | 180 16 |
| Barclay Coal Co | .... | .... |
| Shawnee | .... | 4,642 17 |
| Consumers Coal Co | 223 08 | 4,300 02 |
| Chas. Hutchinson | .... | 84 18 |
| Harvey & Bro | 179 13 | 1,012 10 |
| Wyoming Valley | 49 16 | 5,657 13 |
| Henry Colliery | .... | .... |
| Fall Creek | | .... |
| New England | 672 17 | 5,068 10 |
| Delaware & Hudson Coal Co | 72 15 | 4,726 13 |
| Maltby Colliery | | 1,294 15 |
| Gaylord Colliery | .... | |
| Butler, H S M | | |
| Tompkins | .... | 599 10 |
| Chauncey Colliery | 173 04 | 4,971 04 |
| Ravine Colliery, P & E | .... | |
| Maryland Anthracite | | 415 11 |
| Rough & Ready | | 291 06 |
| Rock Tunnel | .... | |
| Butler Colliery | 251 12 | 3,760 17 |
| Other Shippers | .... | 29 06 |
| Total Wyoming | 5,171 06 | 116,949 04 |
| Same time last year | 2,036 09 | 64,100 18 |
| Increase | 3,134 17 | 53,848 06 |
| Decrease | .... | .... |
| HAZLETON REGION. | | |
| Central Coal Co | .... | .... |
| Ashburton Colliery, R. R. Carter | | 4,735 12 |
| Mount Pleasant | 430 04 | 4,266 09 |
| Hazleton | 7,778 04 | 52,509 19 |
| Stockton—East Sugar Loaf | 2,471 02 | 37,415 02 |
| Mount Hall | .... | .... |
| Latimer (A Pardee, Jr., Bro & Co.) | 2,122 16 | 29,612 00 |
| Stout Coal Co | 732 00 | 10,297 10 |
| Harleigh | 2,803 18 | 24,758 07 |
| Evervale Coal Co | 1,319 08 | 18,500 01 |
| Jeddo, (G B M & Co) | 2,958 01 | 36,635 04 |
| Woodside, J C Co | 139 18 | 4,327 15 |
| Highland Coal Co | | 4,347 07 |
| Cross Creek | 495 01 | 9,909 02 |
| Council Ridge | 2,606 02 | 31,428 11 |
| Buck Mountain | 1,734 18 | 18,358 12 |
| Other Shippers | .... | 114 10 |
| Total Hazleton | 24,971 12 | 278,316 01 |
| Same time last year | 8,527 09 | 221,632 09 |
| Increase | 16,444 03 | 56,683 12 |
| Decrease | .... | .... |
| UPPER LEHIGH REGION. | | |
| Upper Lehigh Coal Co | 183 03 | 5,164 04 |
| Same time last year | 781 01 | 16,861 11 |
| Increase | .... | .... |
| Decrease | 579 18 | 11,697 07 |

| | | |
|---|---|---|
| B. M. REGION. | | |
| Spring Brook | | 10,511 09 |
| Honey Brook | 785 16 | 17,369 15 |
| German Pa. Coal Co | | 5,502 19 |
| Spring Mountain | 1,575 00 | 23,216 13 |
| Coleraine | 4 18 | 14,743 07 |
| B. Meadow, D. W | | 61 01 |
| John Connery | | .... |
| Lehigh Zinc Co | | .... |
| Stafford D W | 87 19 | 529 17 |
| Other Shippers | 11 18 | 141 06 |
| Total B M Region | 2,465 11 | 72,076 07 |
| Same time last year | 2,646 19 | 77,464 08 |
| Increase | .... | .... |
| Decrease | 181 08 | 5,388 01 |
| MAHANOY REGION. | | |
| Mt Rose Coal Co | 5 00 | 360 01 |
| Mount Etna | .... | .... |
| Mahanoy Colliery | 1,069 17 | 3,590 07 |
| Coplay Colliery | 1,549 13 | 8,688 01 |
| Glendon Colliery | 153 18 | 4,354 18 |
| Primrose Colliery | .... | 6,968 19 |
| E S Silliman | 1,192 18 | 4,756 02 |
| McNeal Co | .... | 1,605 07 |
| Knickerbocker | 143 13 | 2,540 11 |
| Thomas Coal Co | .... | .... |
| Mammoth Vein | .... | 997 18 |
| New Boston Coal Company | 194 13 | 5,692 06 |
| Coal Mountain | .... | 316 06 |
| Shamokin Coal Company | .... | .... |
| Caledonia M & M | .... | 2,174 03 |
| Coal from Catawissa Railroad | .... | .... |
| Other Shippers | .... | 9 17 |
| Total Mahanoy | 4,309 12 | 41,994 15 |
| Same time last year | 3,451 07 | 77,721 09 |
| Increase | 768 05 | .... |
| Decrease | .... | 35,726 14 |

| WHERE SHIPPED FROM. | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt. | PREVIOUSLY Tons. Cwt. |
|---|---|---|---|
| Total Mahanoy | 4,309 12 | 41,994 15 | 37,635 03 |
| Total B. Meadow | 2,465 11 | 72,076 07 | 69,610 16 |
| Total M. Chunk | | 32 03 | 32 03 |
| Total U. Lehigh | 183 03 | 5,164 04 | 4,981 01 |
| Total Hazleton | 24,971 12 | 278,316 01 | 253,344 09 |
| Total Wyoming | 5,171 06 | 116,949 04 | 111,777 18 |
| Total | 37,101 04 | 514,532 14 | 477,431 10 |
| To L. & S. R., at Penn Haven for r'l. | | 4,174 00 | 4,174 00 |
| Do. for Canal | | 4,184 06 | 4,184 06 |
| At Mauch Chunk for canal | | 2,259 07 | 2,259 07 |
| Total Anthracite | 37,101 04 | 525,150 07 | 488,049 03 |
| Susquehanna region Bit.Coal, F. C'k. | | 552 03 | 552 03 |
| Total by rail and canal | 37,101 04 | 525,702 10 | 488,601 06 |
| Same time last year | 19,181 10 | 462,919 07 | 443,737 19 |
| Increase | 17,919 14 | 62,783 03 | 44,863 09 |
| Decrease | | | .... |
| Forwarded east from M. Chunk by r'l | 36,242 01 | 496,530 16 | 460,288 15 |
| Same time last year | 17,533 01 | 454,780 15 | 437,247 10 |
| Increase | 18,708 16 | 41,750 01 | 23,041 05 |
| Decrease | | .... | .... |
| RECAPITULATION. | | | |
| Forwarded east from M. Chunk by r'l | 36,242 02 | 496,530 16 | 460,288 15 |
| Delivered at Mauch Chunk | 38 16 | 399 05 | 360 05 |
| Del. on line of r'd above M. C'k | 138 12 | 3,032 00 | 2,893 08 |
| Del. ab. M. C. for use of L. V. railr'd. | 567 13 | 13,692 02 | 13,124 09 |
| To L. & S. r'd at Penn Haven for rail | | 4,174 00 | 4,174 00 |
| Do. for shipm't by canal | | 4,184 06 | 4,184 06 |
| At Packerton | 114 02 | 1,430 14 | 1,316 12 |
| At M. Chunk for shipment by canal | | 2,259 07 | 2,259 07 |
| Total | 37,101 04 | 525,702 10 | 488,601 06 |

### Lehigh and Susquehanna Railroad.

Report of Coal shipped for week ending March 6, 1869.

| WHERE FROM | WEEK. Tons. Cwt. | TOTAL. Tons. Cwt |
|---|---|---|
| WYOMING REGION. | | |
| Newport Coal Co | .... | .... |
| Albrig'ton, Roberts & Co | 89 06 | 288 04 |
| New England Coal Co | .... | 21 07 |
| Morgan Mines | .... | .... |
| Warrior Run Mining Co | .... | .... |
| Parrish & Thomas | .... | 3,579 01 |
| New Jersey Coal Co | 348 12 | 2,558 02 |
| Gaylord Mines | .... | .... |
| Delaware & Hudson Canal Co | 2,063 15 | 10,589 16 |
| Lehigh & Susquehanna Coal Co | .... | .... |
| Germania Coal Co | 581 15 | 3,663 12 |
| Franklin Coal Co | .... | .... |
| Audenreid Improvement Coal Co | .... | .... |
| Wilkesbarre Coal & Iron Co | 2,583 07 | 41,002 10 |
| Union Coal Co | .... | .... |
| Mineral Spring Coal Co | 616 09 | 3,198 18 |
| H. B. Hillman & Son | .... | 893 07 |
| Bowkley, Price & Co | 49 10 | 682 19 |
| Wyoming Coal & Transportation Co | .... | 1,108 08 |
| Henry Colliery | 372 05 | 2,270 19 |
| J. H. Swoyer | .... | .... |
| Everhart Coal Co | 248 06 | 5,923 16 |
| Morris & Essex Mutual Coal Co | .... | .... |
| Shawnee | .... | 1366 18 |
| Pine Ridge Colliery | 191 17 | 3,256 09 |
| Lances Colliery | .... | 200 07 |
| Consumers Coal Co | .... | .... |
| Harvey Brothers | .... | .... |
| Lehigh & Luz. Coal Co | 942 13 | 8,427 00 |
| Other Shippers | .... | .... |
| Total Wyoming Region | 8,091 05 | 89,031 06 |
| UPPER LEHIGH REGION. | | |
| Upper Lehigh | 2,535 13 | 28,974 14 |
| Other Shippers | .... | .... |
| Total Upper Lehigh Region | 2,535 13 | 28,974 14 |
| HAZLETON REGION. | | |
| A. Pardee & Co | 17 00 | 263 16 |
| Linderman & Skeer | .... | 25 05 |
| Sharpe, Weiss & Co | .... | 205 17 |
| Wm. Taggart | 15 17 | 111 12 |
| Harleigh Coal Co | 27 01 | 171 07 |
| G. B. Markle & Co | .... | 73 11 |
| Ebervale Coal Co | .... | 99 13 |
| Stout Coal Co | .... | .... |
| Buck Mountain Coal Co | .... | 83 03 |
| Coxe Brothers & Co | 28 01 | 55 02 |
| Ashburton Coal Co | .... | .... |
| Highland Coal Co | .... | .... |
| Pardee Brothers & Co | 26 02 | 26 02 |
| Jeddo Coal Co | .... | 94 03 |
| Mount Hall (J. S. S.) | .... | .... |
| R. R. Carter | .... | 16 18 |
| Other Shippers | .... | 73 14 |
| Total Hazleton Region | 114 02 | 1,245 01 |
| MAUCH CHUNK REGION. | | |
| Lehigh Coal & Navigation Co | .... | .... |
| Summit Mines | 3,460 06 | 34,076 17 |
| Room Run Mines | .... | 5,994 17 |
| Other Shippers | .... | .... |
| Total Mauch Chunk | 3,460 06 | 40,071 14 |
| " Mauch Chunk Region | 3,460 06 | 40,071 14 |
| " Hazleton | 114 02 | 1,245 01 |
| " Upper Lehigh | 2,535 15 | 28,974 14 |
| " Wyoming | 8,091 05 | 89,031 06 |
| Grand Total | 14,201 06 | 158,322 15 |
| Corresponding week last year | 3,545 19 | 43,797 08 |
| Increase | 10,655 07 | 115,525 07 |
| Decrease | .... | .... |
| Forwarded South from Mauch Chunk by Rail | 12,545 17 | 143,530 12 |
| Delivered on line of L. & S. R. R. ab've M'ch C'k. | 733 18 | 6,199 04 |
| Delivered to Lackawanna & Bloomington Railroad at Plymouth Bridge | 745 07 | 4,768 01 |
| Delivered to L. V. R. R. Co, at Sugar Notch | 176 04 | 4,824 18 |
| Delivered at Coal Port for shipment by canal | | .... |
| Total | 14,201 06 | 159,322 1 |

### Schuylkill Coal Trade.

BY RAILROAD AND CANAL, FOR WEEK ENDING, MARCH 11.

| | RAILROAD. | CANAL |
|---|---|---|
| St. Clair | 34,410 | .... |
| Port Carbon | 8,205 | .... |
| Pottsville | 2,329 | .... |
| Schuylkill Haven | 3,808 | .... |
| Auburn | 445 | .... |
| Port Clinton | 9,401 | .... |
| Company's use | 759 | .... |
| Total for week | 59,348 | .... |
| Previously this year | 494,353 | .... |
| Total | 553,701 | |
| Same time last year | 550,702 | |
| Increase | 2,999 | |

### Cumberland Coal Trade.

By B. & O. RAILROAD.—The shipments over the Baltimore and Ohio Railroad, for the week ending March 6, were as follows:

| | |
|---|---|
| From Cumberland and Pa. Railroad, via Cumberland | |
| Consolidation Company | 2,082 04 |
| Borden | 1,587 01 |
| Allegany | 160 01 |
| Midland | 792 14 |
| American | .... |
| From George's Creek, via Piedmont. | |
| George's C. & I Company | 1,407 10 |
| Central | 1,438 12 |
| Atlantic | 781 08 |
| Savage Mt | 70 11 |
| Swanton | 369 13 |
| Potomac | 784 12 |
| Piedmont | 1,395 17 |
| Franklin | 756 13 |
| Hampshire | 1,926 07 |
| American | 2,096 17 |
| Barton | 562 08 |
| From Eckhart RR. | |
| C. & I. Co | 836 05 |
| Total | 18,208 03 |

The following will show the exports of coal from the port of New York for the week ending March 9, and for the season to that date, also the amount exported last year for the some period;

| | | |
|---|---|---|
| Exports for the week | tons | 1,842 |
| Do. from January 1 | do | 13,452 |
| Do. same time last year | | 10,021 |

### At Philadelphia, March 10, 1869.

| | | | |
|---|---|---|---|
| Lehigh L'p and St'mb't.. | 7 00 | " Egg and Stove. | |
| " Broken and Egg.. | 6 50 | " Chestnut | |
| " Stove | 7 00 | Locust Mount Lump | 4 00 |
| " Chestnut | 6 25 | " Steamboat. | 4 00 |
| Schuylkill R. A | | " Broken | 4 00 |
| " Chestnut | | " Egg | 4 00 |
| " W. A. Lump | | " Stove | 5 00 |
| " Broken | | | |

SPECIAL COALS.

| | | | |
|---|---|---|---|
| Lorberry Coal | 5 00 | 5 50 | Burnside R. A.Egg.& St. 4 75 5 00 |
| Shamokin | 4 75 | 5 25 | Powelton Coal Co 5 00 |
| Franklin, (Lykens Val.) | | 5 25 | Hill & Harris, Egg & St. 4 50 |
| Broad Top | | 6 00 | Henry Clay, Egg & St.. 4 50 4 75 |

Dealers in these coals may be found in are advertising columns.

### Powelton Coal at Philadelphia, March, 1869.

| | | | |
|---|---|---|---|
| Powelton Egg and Stove | $5 00 | Powelton Gas | $7 80 |
| Powelton Semi Bituminous | 5 00 | | |

### Scranton Coal at Elizabethport, March, 1869.

(Corrected weekly by D. L. & W. R. R. Co.

| | | | | | |
|---|---|---|---|---|---|
| Lump | 4 75 | .... | Egg | 4 75 | .... |
| Steamer | 4 75 | .... | Stove | 5 00 | .... |
| Grate | 4 75 | .... | Chestnut | 4 25 | .... |

### Prices for Pittston Coal at Newburgh, March, 1869.

(Corrected weekly by Penna. Coal Co.)

| | | | | | |
|---|---|---|---|---|---|
| Lump, per ton, 2240 lbs.. | 4 50 | .... | Egg " " | .... | 4 60 |
| Steamer, " " | 4 50 | .... | Stove " " | .... | 4 90 |
| Grate " " | 4 50 | .... | Chestnut " " | .... | 4 40 |

70c. Freight to New York.

### Lackawanna at Rondout, March, 1869.

| | | | | | |
|---|---|---|---|---|---|
| Lump | 4 60 | .... | Egg | 4 70 | .... |
| Steamer | 4 60 | .... | Stove | 4 90 | .... |
| Grate | 4 60 | .... | Chestnut | 4 00 | .... |

65 cents Freight to New York.

### Lehigh Coal at Mauch Chunk.

March, 1869.

| | | | |
|---|---|---|---|
| Lehigh L'p and Steamboat | $3 50 | Stove | $3 75 |
| Broken and Egg | 3 50 | Chestnut | 3 25 |

$2 35 Freight to Philadelphia.

### Lehigh Coal at Elizabethport, March, 1869.

| | | | | | |
|---|---|---|---|---|---|
| Lump | 6 00 | .... | Stove | 3 75 | .... |
| Steamboat and Broken.. | 5 00 | .... | Chestnut | 3 25 | .... |
| Egg | 5 00 | .... | | | |

50c. Freight to New York.

### Wilkesbarre Coal at Hoboken, March, 1869.

(Corrected by Wilkesbarre Coal & Iron Co.)

| | | | | | |
|---|---|---|---|---|---|
| Lump | 4 75 | .... | Egg | 4 75 | .... |
| Steamer | 4 75 | .... | Stove | 5 00 | .... |
| Broken | 4 75 | .... | Chestnut | 4 50 | .... |

45 cents Freight to New York.

### At Baltimore, March, 1869.

| Wholesale prices to trade. | | | Trevorton R. A | $6 25 | 6 50 |
|---|---|---|---|---|---|
| Wilkesbarre by cargo or car load | $6 60 | @6 80 | By retail, per ton of 2,240 lbs., delivered | 8 75 | 9 25 |
| Pittston and Plymouth.. | 6 25 | 6 75 | Georges C'k & Cumberland f. o. b. at Locust Point for shipping | .... | 5 00 |
| Shamokin R., or W. Ash | 6 25 | 6 50 | | | |
| Lykens Valley, R. A | .... | 6 85 | | | |

### At Havre de Grace, Md.

| | | | | | |
|---|---|---|---|---|---|
| Cargo prices for shipment *south* of Patapsco River, (drawback allowed of 10 per centum.) | | | Shamokin R. or W. Ash. | $.... | @.... |
| | | | Lykens Valley R. A | .... | .... |
| Wilkesbarre and Pittston | | | Trevorton R. A | .... | .... |
| W. Ash | $.... | @.... | | | |

### At Georgetown, D. C. and Alexandria, Va.

George's Creek and Cumberland f. o. b. .... @4 75

### Prices of Gas Coals.

March, 1869.

| PROVINCIAL. Duty, $1 25 | Coarse. Gold. | Slack. Gold. | AMERICAN. | Coarse. Currency. | Slack. Currency. |
|---|---|---|---|---|---|
| Block House | $1 75 | @4 75 | Westmoreland Co | $8 50 | $8 00 |
| Gowrie | 1 75 | 75 | Despard Coal Co | 8 50 | 8 00 |
| Lingan | 1 75 | 75 | Penn | 8 50 | 8 00 |
| Sydney | 2 13½ | 71½ | Newburgh Orrel Gas | 8 50 | 8 00 |
| Pictou | 2 13½ | 1 15½ | West Fairmont Gas Coal | 7 00 | |
| Little Glace Bay | 1 75 | 1 00 | Powelton Gas Coal | 8 00 | 7 00 |
| Caledonia | 1 60 | 75 | | | |

### Prices of Foreign Coals.

March.

Duty, $1 25 per ton.

Corrected weekly by PARMELEE Bros., 32 Pine Street, N. Y.

| | | | |
|---|---|---|---|
| Liverpool Gas Caking | $ 9 50 | Liverpool House Canne. | 18 00 19 00 |
| " " Cannel | 14 00 | " " Orrel. | 16 00 18 00 |

Per ton 2240 lbs., Ex. ship.

PRICES FROM YARD.

| | | | |
|---|---|---|---|
| Liverp'l House Orrel, scr'd.. | $16@18 | Liverp'l House Can'l,scr'd | $18 00 20 00 |

Per ton 2000 lb., delivered.

### Coal Freights.

(Corrected Weekly).

### Freights on Coal Sea-borne from Port Richmond, Philadelphia.

March 10, 1869.—From Philadelphia and Reading R. R. Wharves, Phila., to

| | | | | | |
|---|---|---|---|---|---|
| Bangor | | 2 75 | New London | — | 2 00 |
| Boston | 2 00 | 2 50 | Dover | — | 2 75 |
| Providence | | 2 00 | Cohasset Narrows | — | 2 75 |
| Lynn and discharging | | 2 50 | Cambridgeport | — | 2 75 |
| Portland | 2 25 | 2 50 | Dorchester | — | 2 75 |
| Fall River | 2 00 | 2 25 | Fair Haven | — | 2 00 |
| New Bedford | 2 25 | 2 50 | Gloucester | .... | 2 75 |
| Salem | .... | 2 50 | Lawrence | — | 3 00 |
| Newport | — | 2 00 | Old Cambridge | — | 3 00 |
| East Cambridge | — | 2 50 | Saco | — | 2 75 |
| Newburyport | — | 2 75 | Roxbury | — | 2 75 |
| Portsmouth | — | 2 75 | Salisbury | — | 2 75 |
| Charleston | 1 75 | 2 00 | Greenport | — | 2 00 |
| Danversport and discharging | | 2 50 | Norwich | — | 2 00 |
| Amesbury | — | 3 00 | Harlem | — | 1 45 |
| Beverly | .... | 2 75 | New Rochelle | 1 30 | 1 40 |
| Charlestown | .... | 2 50 | Sag Harbor | — | 1 50 |
| Hingham | .... | 2 50 | Spuyten Duyvel | — | 1 40 |
| Marblehead | .... | 2 75 | Williamsburg | — | 1 40 |
| Nantucket | — | 2 50 | Jersey City | — | 1 40 |
| Plymouth | — | 2 75 | New Brunswick | — | 1 20 |
| Provincetown | — | 2 75 | Alexandria | — | 1 25 |
| Washington | — | 1 40 | Fredericksburg | — | 2 00 |
| Calais | — | 2 75 | Wilmington, Del. | — | 75 |
| Machiasport | — | 2 75 | Bath | .... | 2 50 |
| Hoboken | | 1 40 | East Greenwich | | 2 25 |
| Hyannis | | 2 75 | Albany | | 1 95 |
| Malden | | 3 00 | New York | | 1 40 |
| Nahant and discharge | | 2 75 | Troy | | 1 95 |
| Weymouth and towing | | 2 75 | | | |

### Provincial Freights.

| TO NEW YORK. | | TO BOSTON. | |
|---|---|---|---|
| Sydney | $ | Sydney | $ |
| Lingan | | Lingan | |
| Cow Bay | | Cow Bay | |
| Port Calidonia | | Port Calidonia | 1 |
| Little Glace Bay | | Little Glace Bay | |

### From Elizabethport and Port Johnson.

| | | | | | |
|---|---|---|---|---|---|
| Albany | $.... | @— — | New London | $1 25 | — — |
| Boston | 1 75 | 2 25 | Newport | 1 40 | — — |
| Bridgeport | 1 15 | — — | New York | 50 | — — |
| Fall River | 1 40 | — — | Norwalk | 1 15 | — — |
| Hartford | | — — | Norwich | 1 50 | — — |
| Hudson | | — — | Pawtucket and towing | | — — |
| Wareham | | — — | Portland | 1 75 | |
| Middletown | | — — | Portsmouth | 2 00 | |
| New Bedford | 1 55 | — — | Providence | 1 40 | — — |
| Newburyport | 2 00 | — — | Salem | 1 75 | — — |
| New Haven | 1 15 | — — | Augusta | 3 00 | — — |
| | | | New Orleans | 2 70 | 2 80 |

### [Foreign Freights.]

| | | | |
|---|---|---|---|
| New Castle and Ports on Tyne | £13@£15 keel. | | |
| Liverpool | 12s. 6d.@15s. ton. | | |
| Australian | 9 50@10 00 | Lehigh | 15 50@16 00 |
| do. Wallsend | 10 00 10 50 | Liverpool | 13 00 .... |
| Bellingham Bay | 11 00 ... | Pittston, ton | 14 50 15 00 |
| California | 7 00 9 00 | Scranton | 14 00 15 00 |
| Cumberland cks | 30 00 32 00 | Scotch | 13 00 .... |
| do bulk | 28 00 ... | Vancouver Island | 12 50 .... |
| Chili | 10 00 .... | | |

### Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

### At New York, March 10, 1869.

| | | | | | |
|---|---|---|---|---|---|
| Schuylkill R. A., choice | $ .... | $.... | Schuylkill Chestnut | $.... | .... |
| " Ordinary | .... | .... | Lehigh W.A.L'p old Co. | .... | 6 00 |
| " W. A. Lump | .... | .... | " Broken | .... | 5 25 |
| " Steamboat | .... | .... | " Egg | .... | 5 25 |
| " Broken | .... | .... | " Stove | .... | 5 25 |
| " Egg | .... | .... | " Chestnut | .... | 4 75 |
| " Stove | .... | .... | Shamokin | .... | 4 75 |

SPECIAL COALS.—DEALERS' QUOTATIONS.

| | | | | | |
|---|---|---|---|---|---|
| Diam'd Vein R.A.,Sch'kill | .... | .... | Old Co.'s W. A. Lehigh | 6 00 | 5 25 |
| Locust Dale W. A., " | .... | .... | Mt. Pleasant | 6 00 | 5 25 |
| Honey Brook " Lehigh | 5 25 | 6 00 | Buck Mountain | | |
| Harleigh " " | 5 25 | 6 00 | Fulton | 5 50 | 6 50 |
| Spring M'n " " | 5 25 | 6 00 | Stout | 5 50 | 6 50 |
| Sugar Creek " " | 5 25 | 6 00 | New England Red Ash | | .... |
| Sugar Loaf " " | 5 25 | 6 00 | Wyoming | 6 00 | .... |

Dealers in these Coals may be found in our advertising columns.

### Rates of Transportation to Tide Water.

[BY RAILROAD.]

### To Port Richmond, Philadelphia.

Philadelphia and Reading Railroad, from Schuylkill Haven.....$2 00

The following are the drawbacks allowed on all coal shipped East of New Brunswick and South of Cape Henry, until further notice.

| | Drawback. | Freight. | Nett |
|---|---|---|---|
| Lump | .. | $2 .. | $.... |
| Steamboat | .. | 2 .. | .... |
| Broken | .. | 2 .. | .... |
| Egg | .. | 2 .. | .... |
| Stove | .. | 2 .. | .... |
| Chestnut | .. | 2 .. | .... |

From Port Carbon, 8 cents per ton more.

### To Elizabethport.

| | |
|---|---|
| L. V. Railroad from Mauch Chunk to Easton | $ 1 04 |
| C. R. R., N. J., Easton to Elizabethport | 1 55 |
| | 2 59 |
| Shipping Expenses at Elizabethport | 25 |
| Total | 2 84 |

### To Port Johnson.

| | |
|---|---|
| L. V. R R | $ 1 04 |
| C. R. R. of N. J | 1 63 |
| Shipping Expenses | 25 |
| Total | 2 92 |

### To Hoboken.

| | |
|---|---|
| L. V. R.R | 1 04 |
| Morris & Essex R.R | 1 63 |
| Shipping Expenses | 25 |
| Total | $2 92 |

### SAN FRANCISCO STOCK MARKET.

A telegram from San Francisco, dated March 11, quotes:

| STOCKS. | Per Sh. | | SHARES. | Per Sh. | |
|---|---|---|---|---|---|
| Gould & Curry | 112@ | | Belcher | 22 | .. |
| Savage | 70 | | Imperial | 103 | .. |
| Chollar Potosi | | | Alpha | 46½ | .. |
| Hale & Norcross | 91 | 92 | Amador | .. | .. |
| Crown Point | 74 | .. | Kentuck | 261 | 266 |
| Yellow Jacket | 69¼ | 70 | Ophir | 36 | |

DIVIDENDS—Savage Mining Co.—$4 in coin per share—payable 11th inst.

Yellow Jacket M. Co.—$5 in coin per share—payable 15th inst.

### Statistics of California.

The report of the Surveyor-General of California, recently published, contains some interesting statistics concerning the resources of the State. On the 1st of January, 1868 the number of quartz mills in California was 360; number of tons of ore crushed in 1867, 321,480; number of mining ditches, January 1, 1868, 874; total number of miles of ditching, 11,949; number of inches of water used per day, 711,930; number of acres of land irrigated, 70,568; number of woolen mills in operation, 6; quantity of wool manufactured into cloth, 3,125,000 pounds; quantity of coal mined, 60,262 tons. The county of Nevada heads the list of quartz mining counties, having reduced, in 1867, 125,000 tons, nearly one third of the total quantity; Amador county ranks second, with 100,000 tons; Plumas third, with 40,000 tons; and Sierra fourth, with 20,000 tons. Tuolumne county has 7,210 miles of mining ditches—more than all the other counties in the State combined.

AMERICAN

# Journal of Mining.

WESTERN & COMPANY, Proprietors

ROSSITER W. RAYMOND, EDITOR.

OFFICE, 37 PARK ROW, NEW YORK.

By publishing contributions, the JOURNAL OF MINING does not necessarily endorse the positions assumed by contributors.

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TERMS.—SUBSCRIPTION, $4 00 per annum, in advance; $2 25 for six months. Single copies, Ten Cents. New York City subscribers are required to pay 50 cents a year extra for delivery. ADVERTISING: Twenty-five cents per line of nine words for each insertion inside, and forty cents outside. Terms invariably cash in advance.

DESIGNING, LITHOGRAPHING, WOOD ENGRAVING, and JOB PRINTING

Executed in elegant style, on reasonable terms.

NEW AGENCY.—GEO. E. CUMMINGS has been appointed our sole agent in Philadelphia, Pa., for the AMERICAN JOURNAL OF MINING, our new paper, the MANUFACTURER AND BUILDER, and our Spanish paper, EL CORREO HISPANO-AMERICANO. His address is 154 South Fourth street, Philadelphia, Pa., where all information respecting communications, subscriptions and advertisements for these papers will be gladly given to those who may wish to favor us with a call.

In making remittances for subscriptions, always procure a draft on New York, or a *Post Office Money Order*, if possible. Where neither of these can be procured, send the money, *but always in a registered letter*. The registration fee has been reduced to *fifteen cents*, and the present registration system has been found by the postal authorities to be virtually an absolute protection against losses by mail. *All* Postmasters are obliged to register letters whenever requested to do so.

☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "JOURNAL OF MINING," instead of "MINING JOURNAL," and to give the number of our Box at the Post Office, which is 5969, to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

NEW YORK, SATURDAY, MARCH 13, 1869.

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## NOTICE TO CORRESPONDENTS.

In consequence of a new regulation recently adopted by the Postmaster of this city to facilitate the early delivery of mail matter, we have to request our correspondents, in addressing us, to give the number of our post-office box, No. 5,969, in lieu of, or in connection with our business office address.

## THE RENSSELAER POLYTECHNIC INSTITUTE.

This scientific school is one of the oldest, if not itself the oldest in the country; and certainly no other American institution has furnished so many successful engineers. The course of study is very severe; and young men who graduate and receive their degrees at Troy are qualified to commence brilliant and useful careers.

It seems strange to us that for so many years, during which other institutions, no whit more deserving of support, have been munificently endowed, this one has been left entirely dependent upon the fees of the students. As a consequence, those rates are comparatively high. Two hundred dollars a year is, we are informed, the present charge for tuition; and it is not found to be more than sufficient for the maintenance of an efficient system of instruction and practical training. But it undoubtedly operates to prevent many from attendance who would gladly purchase at a lower rate the benefits of a scientific education.

In addition to its age and general excellence, the Rensselaer Institute has two special claims upon the public. The first lies in the fact that in the destruction of its buildings by fire, a few years ago, its scientific resources were sadly crippled. It is true that indomitable energy and perseverance have done much to repair the damage. A new and handsome building upon the steep hillside overlooking the city of Troy, and the beautiful and well-appointed WINSLOW laboratory close by, bear witness to the vitality which inheres in this enterprise, and give promise of its extended activity and influence in the future. The Institute is gradually replacing its lost library apparatus and collections. It is slowly recovering from the disaster which befell it; and there is no doubt of its ultimate and complete success on a larger scale and by a higher standard than measured its ancient glory. But this recovery, however sure, ought to be quick, not slow. Whatever money can do to annihilate time should be done.

The other claim of this institution upon the public is the provision which has been made in its courses for the education of mining engineers and metallurgists. During a recent visit we were much pleased with the progress already achieved in this department, and the judicious plans matured for the future.

As our readers are aware, Prof. G.W. MAYNARD occupies the chair of mining and metallurgy.

When it shall at last come to pass that our American, like the European mining schools, shall be distinguished, each in some special branch of the arts related to mining, we think Rensselaer will be likely to represent especially the metallurgy of iron, a branch so important as to form in some foreign schools, as, for instance, that of Losben, the chief attraction for students, and the main portion of the instruction imparted. Troy is the site of the far-famed BURDEN iron furnaces and rolling mill, as well as the scarcely less celebrated Bessemer Steel Works of GRISWOLD & Co. The latter were seriously injured—we may almost say destroyed—by fire a few months ago, but are now being rebuilt under the experienced eye of Mr. HOLLEY. They can produce at present but eight tons of Bessemer steel daily; but the works now in progress will increase this capacity to upwards of fifty tons. The innumerable puddling furnaces and other iron-metallurgical works in Troy, added to the two establishments we have mentioned, are so many arguments for the importance of maintaining with ample power, in the midst of an industry so vast and profitable, an institution like the Rensselaer, to serve as a store-house for the preservation and an exchange for the communication of a great number of valuable observations concerning the latest processes of the metallurgy of iron. Moreover, some provision might be made for giving certain courses of instruction by public lectures or otherwise to the workmen themselves. Even a common laborer accomplishes all the more and all the better for understanding what he is doing.

A course of popular and scientific lectures is in progress for the aid of the Institute library. We sincerely hope it may succeed; but this is too slow a means to achieve the desired result. There is little merit in urging other men to give their money for the public good; but we think ourselves justified by the circumstances in remarking that the rich men of Troy, and all the graduates of the institution, or their friends, should unite to raise for the school a large permanent endowment. Such assistance, rendered at the right moment, *i. e.*, very soon, would have a marvellous effect in stimulating the activity and doubling the beneficent influence of the Institute. Who endows the Rensselaer school?

## MINING LAWS IN THE MIDDLE AGES.

The earliest records of mining law in the middle ages do not create, they only recognize and establish, the customs which were even then already old. If the source of these customs is lost in obscurity, so also is their gradual development; for, as I have said, the earliest publication of them was made in Trent—in other words, in a foreign land, where they came into collisison with existing systems. Of their peaceful growth at home we have no trace. They suddenly appear in history, adult and strong. But they soon met with opposition and modification at home, where the emperor and the territorial sovereigns laid claims, at the end of the 12th century, to the mining royalty. The German mining law is a product of this antagonism—a compound of mining freedom with mining royalty.—(*Berafreiheit und Bergregal.*) The contest between the two principles occupied part of the 13th and 14th centuries. The proud dynasty of Hohenstauf began the war. Frederick I. claimed the mines of Trent as imperial royalties (*regalia*), and forced the bishop to accept a lease of them. The mines themselves were not interfered with. All that the emperor desired was a recognition of his prerogative, as a support to future claims; and, in general, the struggle of the German emperors for the royalty of mines was prompted, not by their desire to appropriate and work them, but by their claim of the right to levy on mining imperial taxes, independently of the different legislatures and sovereigns of the empire. Meanwhile, the territorial rulers saw their advantage in promptly adopting and employing for their own interest the theory of royalty; and finally the owners of the soil made themselves heard, and obtained a certain recognition of their claims to some non-precious metals.

During this conflict of ideas, contradictory principles were proclaimed by different parties; and the thirteenth century presents a scene of confusion and uncertainty as to the relations of emperor, prince, landlord, and miner. The famous "Golden Bull," of Emperor Charles IV, dated January 9, 1356, simplified the contest by excluding from it two of the conflicting parties. That emperor was more inclined to augment his hereditary power, as a Bohemian prince, than to increase the prerogatives of his imperial authority, which would pass to some other German sovereign after his death. He therefore, in the imperial law referred to, surrendered the claims of the emperor in favor of the electors; and in fact the result of this partial surrender was the actual exercise of mining royalty by all the other sovereigns, as well as the electors. But the Golden Bull excluded also the land owner, putting all metals, precious and base, together with salines, under one rule, namely, the right of the territorial sovereign. Two forces were now left face to face, the royalty of the princes, recognized by the emperor, and the principle of free mining, already repeatedly recognized to a greater or less extent by the princes themselves. The relations of these two forces were not determined by the Golden Bull, which left the princes free to enforce their claims as far as they had already done so, or might be able to do so in future. The issue of the conflict, thus left to time, was different in different states; but the essential victory remained with the miners. The princes recognized the right of free prospecting and the right of the discoverer to the mineral deposit discovered, reserving to themselves only the usual tribute (finally the tithe) and the rights of police and magisterial jurisdiction. But although mining freedom thus obtained practical recognition, the rights of the sovereigns were exercised in exceptional cases in opposition to this principle. Mines and whole mining districts were granted without reference to the discovery; and the occasional feature of special grants was accepted as a part of the jurisprudence of mines. The procedure necessary to obtain property in minerals also suffered a change. Mere occupation by the discoverer was no longer sufficient; he must "denounce" his claim, and obtain his lease from the prince or his delegate—generally a regularly constituted office or court of mines (*Bergamt, Bergbehorde*). The maxim was still preserved, "The first finder is the first claimant;" but the greater weight was laid upon the "denunciation" (*Muthung*), and the right of the discoverer was forfeited if he failed within a brief period to make his discovery known in the appointed manner. The princes of different states made use of their power to extend and modify existing regulations, so that mining codes proper took the place of the mass of traditional usages which had accumulated through four centuries, and which might have been called, by partial analogy, the common law of mines.

## THE REDUCTION OF COMSTOCK ORES.

It is a popular error to suppose that the processes of American metallurgy are in all cases rude and imperfect. In the extraction of gold from quartz, we are qualified to be the instructors of the world; and the Washoe process for amalgamation of the Comstock silver ores is better adapted to the circumstances of the case than any European method would be. The public has been misled by the fact that the Washoe mills guarantee but 65 per cent. of the assay, to believe that this is the measure of accuracy of the process. Dr. J. P. KIMBALL, in the Memoirs of the American Bureau of Mines, speaks of a loss of $9,000,000 from this source in 1867, having evidently arrived at this startling figure by taking the product of bullion from the Comstock mines for that year, and deduced the loss by the rule of three, thus:

Ross BROWNE says the Comstock probably produced $17,000,000 in 1867. This sum was but 65 per cent. of what it should have been, if all the silver had been extracted. If $17,000,000 is 65 per cent., 35 per cent. must be $9,000,000; *ergo*, this sum represents the loss by inefficient extraction.

Mr. BROWNE fell into the same mistake into which he led Dr. KIMBALL, though, curiously enough, the Report of 1868 which contains his observations, fortified by an extract from the "Memoirs," contains also the very data which disprove the conclusion. Mr. BROWNE's official tables of the product of bullion for 1867 gave an aggregate of $13,626,062. Why did he say, then, that the whole product was probably $17,000,000? No mine of importance is omitted in the tables, and certainly not a dollar of bullion received by any one of the companies is forgotten in their published reports; yet here is a cool addition of three and a half millions to the official aggregate! This money is the estimated sum, over and above the bullion reported by companies, which is made out of the ore *by the mills*.

Let us look a little closer into the alleged loss of 35 per cent. by imperfect extraction in the Washoe mills. The truth is that the assays are made with dry powdered samples, and the ore is sent to the mills with more or less moisture, varying, it is said, from three to ten per cent. Sixty-five per cent. of the assay value per dry ton, applied to the moist ton means, therefore, in reality, from 67 to 72 per cent., which is what the mine receives. But besides this, the amalgam caught by simple concentration from the tailings is a perquisite of the mill. In fact, the low rates of custom mills are made possible by the margin of profit left between the 67 to 72 per cent. which the mills guarantee, and the 75 to 80 per cent. which they actually extract. The Washoe process is not a rude and imperfect one in principle; it is scientific and remarkably successful—better for the circumstances than any European process. A little more economy and care in managing the details, and above all such a study of the process itself by the mill-men as would settle its real nature and principles, and lead to some

uniform rules as to the management of certain parts of it, would make it a credit to American ingenuity and skill. A great improvement has been made since Mr. KUSTEL described the Washoe process, in the introduction of large pans; and the necessity for increased economy is now leading to still other improvements. In this respect the Comstock mining enterprises have nothing to be ashamed of. The comparison often made with the Reese River mills, which charge high prices and guarantee 80 per cent., is thus seen to be based on an apparent, rather than a real, difference. No doubt the loss by the Washoe process will be much larger if the proportion of native gold and silver in the ore decreases in depth.

## NEW PUBLICATIONS.

THE MANAGEMENT OF STEEL. By GEORGE EDE; *employed at the Royal Gun Factories' Department, Woolwich Arsenal. From the Fourth London Edition.* New York: D. APPLETON & Co., 1867.

The successive editions of this little manual have gradually increased from a small pamphlet to a goodly duodecimo of over 200 pages, and we are glad to find that a reprint is accessible to our American workmen. As a practical worker in steel Mr. EDE stands very high, and his book affords evidence that he possesses the rarest of all faculties, viz: the ability to state plain facts in a plain manner. The result is that the book is crammed full of thoroughly practical directions and valuable suggestions. On looking over its pages we have frequently felt tempted to make a few extracts for the benefit of our readers. The difficulty has been to make a selection from such a profusion of good matter, and we therefore content ourselves with quoting the following remarks on the quality of the water employed in tempering steel:

"The more the water is used for hardening steel the softer it becomes, and has a tendency to act less suddenly upon the steel; consequently the less frequently the water used for the purpose is changed, the better it is for hardening the steel—that is, providing the water has not by continual use become greasy. The water is not made better for giving the steel a greater degree of hardness by being long in use, but it is made better for the purpose because it is less likely to crack the steel than fresh water; therefore, as the water wastes, fresh water should be added to it. As it is necessary to clean the tank out occasionally, it would be well, before using fresh water, to make it quite hot by putting bars of hot iron into it and allowing it to become nearly cold again before using it; or the chill may be taken off the water and the water made softer by putting some ignited charcoal or wood ashes into it. It is obvious that the colder the water the more effectually it hardens the steel, and the more especially (*sic*) when the steel is immersed suddenly, and a rapid movement given to it whilst it is becoming cool; but when fresh cold water is used, there is always greater danger of the steel cracking. Brinish liquids, such as aquafortis, urine, or water changed with common salt, etc., produce rather more hardness than plain water; but, for most articles, plain water with the chill off gives sufficient hardness to the steel. Water at about sixty degrees, measured by the thermometer, is the most suitable temperature to prevent steel cracking in hardening. Water holding soap in solution prevents the steel from hardening. There are certainly some kinds of tools, also some pieces of work used in machinery, which require to have a greater amount of hardness given to them than can be given by plain water. There are some kinds of guages, burnishers, and certain kinds of dies which require to be very hard, so that it becomes necessary at times to use a saline liquid; a file requires also to have a nice hard tooth. When steel is required to be made extremely hard, it may be quenched in mercury, the chemists' name for quicksilver; but this fluid, it is obvious, can only be used on a small scale."

Those who have carefully read the above, and, *a fortiori*, those who have carefully read the whole volume, will, we think, agree with us when we say that, notwithstanding the unqualified praise which we have accorded to this book, it might be much improved if submitted to the editorial revision of some well-qualified person. In this way certain inelegancies, and consequently indefiniteness of expression, might be readily amended.

## ANSWERS TO CORRESPONDENTS.

☞ Correspondents are requested to sign name and address in full, as sometimes we may wish to write them by mail, when the answers they require are not of importance to our readers in general. In no case will the names thus enclosed be published, if a *nom de plume* is signed to the letter to indicate the writer's desire to remain unknown.

QUERIST, MISSOURI.—The original matrix of platinum is supposed to be principally serpentine, fragments of which are frequently found in platinum sand; but the metal is seldom found in its original geological formations. It usually occurs in alluvial deposits and in the sand of veins, associated with palladium, rhodium, osmium, ruthenium, iron, copper, lead and sometimes silver. Occasionally, it is mixed with grains of osm-iridium, gold, magnetic and chromic iron ore, quartz, zircon, spinel, etc. The principal districts in which it is found are in South America and Russia. More than 90 per cent. of the product of the world comes from the latter country. The largest nugget of platinum ever discovered is the one preserved in the DOMIDOFF cabinet, which came from the Ural Mountains, and weighs 21 lbs., Troy. You are mistaken in supposing platinum to be more valuable than gold. It is worth about five times as much as silver, or a little less than one-third as much as gold.

MINERALOGIST, ALA.—The compounds of tungsten occurring in nature are tungstic acid, or wolfram ochre; tungstate of lead, or stolgite; tungstate of lime, or sheelite; tungstate of iron, or wolfram; and tungstate of manganese, or huebnerite. The latter mineral was discovered in Mammoth District, Nevada, in 1865. It occurs in the mineral veins, with scheelite, fluorspar and apatite. Its crystallization is rhombic, and its form generally columnar or foliated. It has an uneven fracture, reddish-brown to dark brown or black color, yellowish-brown streak, diamond luster on the cleavages, and greasy luster elsewhere. It is semi-transparent to opaque; its hardness is 4.5, and its specific gravity is 7.9. It contains 76.4 per cent. of tungstic acid and 23.4 per cent. of protoxide of manganese. It does not occur in large quantities.

N. S. D., NEW MEXICO.—The value of mica or isinglass in the arts depends upon its transparency and smooth cleavage, and the size of the masses in which it occurs. The specimens you send us are inferior in the first two respects, and as to the third, we cannot decide by inspecting small pieces. Moreover, even it it should prove on further exploration to be suitable for use, the inaccessibility of the locality and the cost of transportation would prevent its profitable sale. Possibly it may become valuable to supply, on a small scale, a local demand; but we cannot give you much encouragement.

D. C. B., PEEKSKILL, N. Y.—The purification of black lead is not a chemical, but a mechanical process. It is our opinion that the best method is that of simple selection of the purest masses. Many deposits furnish a natural material of great excellence; and artificial processes are not likely to compete successfully in this respect with nature.

J. M., COLORADO.—As we have frequently had occasion to say, the difficulties in the treatment of Colorado gold ores are economical, not chemical. The arguments by which you support your plan are therefore good for nothing, without carefully prepared and convincing exhibits of its cost and yield.

☞ A new system of telegraphy, invented by Bonelli, has recently been brought to public notice at Paris. The Emperor, Napoleon III., to whom it was submitted, it is stated, has expressed his complete satisfaction with the new process—the advantages of which consist in the perfect and authentic exactness of the messages sent, as well as the increased rapidity of transmission. The Government director of the French telegraphs has been authorized to offer every facility necessary for the general adoption of the new apparatus.

# Correspondence.

[To insure insertion of correspondence in our columns, the full name and address of the writer must be given.]

## SOUTH AMERICAN CORRESPONDENCE.—New Series, No. 1.

### THE DELTA OF THE ORINOCO.

"Land, ho!" "Where away?" "On the starboard quarter."—Such were the cries that brought us all on deck. Off to the west there lay the land—low, just above the sea—dimly seen, with many openings. Such was the appearance of the many small mouths of the Orinoco. A few hours' sail, and the higher land of Barincas appeared, right over the bow, while a little to the starboard was the "Boca Grande," the large mouth of the grand river. Soon we were over the bar and safely within a most magnificent natural harbor, with water sufficient to float the largest man-of-war.

While waiting for a pilot to guide our vessel up the river, we had time to study somewhat in detail the formation of the delta. Previous investigations along other bocas aided us in our operations. This river drains nearly all of the northeast corner of South America. In this office it is assisted by the Essequibo and a few minor streams. It rises in the Parima mountains, which form the division between the hydrographical basins of the Amazon, Orinoco and Essequibo. Its first flow is west, to throw off an inosculating branch, the Cassiquiare, to unite with the Amazon. It then turns northwest, then north, and then finally makes a grand detour eastward, in which direction, according to poetry, it "rolls its foaming tide to the sea." It rises in mountains of crystalline rock, and finds its way across many ranges of the same material, and over plains of the same, but highly decomposed, or over rocks of tertiary age. It receives many tributaries from the same soft strata. Its plains have large deposits of Post-Pliocene. The volume of water it gathers from these plains and mountains during the rainy season, *i. e.*, from July to November, is full sixty feet in perpendicular height above its low water mark. Unlike the Ohio, and other streams in our country, which have as great a rise, this large quantity of water continues to flow for a long period of time. During this period it is thick and turbid with sediment, often staining the clear blue waters of the Atlantic one hundred and fifty miles out to sea. This great flow of transported material continues for nine months of the year.

We can go back in the geological record, and find the mouth of this river, then a single mouth, as high up as Guayana Viejo, in long. 62° 45' west from Greenwich, or nearly 200 miles distant from the present coast line. At this point, the river breaks over a crossing ledge of black gneiss; and from the mast head of the vessel, the ancient coast-line, marked by ranges of low hills, can be seen stretching southeast by east from 5 to 15 miles distant from the present bed of the river. To the northeast lie low flat lands, extending without any elevations to break their flat sameness on to the Gulf of Paria. This wide valley is covered with modern or ancient river alluvion, which is seen along the river bank as low down as Barrancas, at the upper end of the present delta. From this point on to the sea, 130 miles along the main channel, are seen the low flat lands, only elevated a few feet above high water mark, covered with mangle bushes, water-palms and other semi-aquatic vegetation.

At Barrancas there flows off northwards the Macareo Cano, quite as wide as the main stream. This divides and subdivides, as does also the main stream, until the most northern mouth of the Orinoco finds entrance to the sea, 140 miles distant from the Boca Grande. This wide area of 140 by 130 miles is cut up by innumerable branches, between which lie low wet lands of untold fertility.

Every overflow of turbid water leaves behind its contribution of thin paste, composed of alkaline and other material derived from felspathic and other rocks. Where it is cultivated by the native Indians, it produces corn, sugar cane, and plantains in great abundance. Perhaps there is no portion of the earth's surface better adapted for the growth of the cane than the lower portion of the Orinoco river. Its capacity in superficial area exceeds that of all the British West India Islands together. Give it the levels of the Lower Mississippi, and a population devoted to agriculture, and it would supply the world with saccharine extracts of all varieties, from Stuart's "honey syrup," to his "treble refined loaf."

It was interesting, while lying at the bar, to study the varying contest between the *River* and the *Sea*. The silent river, now in swelling volume, and now in gentler streams, yet ever acting, bears its constant burden, composed of individual atoms, scarcely visible to the eye, and pours it into the bosom of the sea. The latter, receiving but throwing back, with everblowing trade winds and huge rolling billows, the turbid contribution, heaps up the deposit in part, just on the line of equal action, thus forming a "*bar*." But a portion goes over into the deeper parts of the sea and is gradually deposited in reduced thickness, as it proceeds into deep waters. By this process the waters are shallowed, and thus the line is moved outwards. The bars receive semi-daily contributions at low and high tide, and, sooner or later increase in thickness or height, until they are bare at low tide. Then aquatic birds light upon them, and fertilize them with guano. Seeds of the mangle take root, and vegetable *debris* add to the growth of the slowly increasing and uprising bar. The bar thus becomes an island; outside of the island new bars are formed, and outside of the new bars, newer areas of shoal water. The waves which would seem at first sight to be furious and powerful enough to destroy the newly formed land, do but contribute to its strength by heaping up on the windward side sand and shells, and stranded fish. Thus the new land grows out to seaward. As the sea sand accumulates above high water mark and dries in the heat of the tropical sun, the ever-blowing trade wind bears the fine dry sand inland, and contributes to increase the height of the land, raising it above high water mark, and making it permanently dry land, bearing plantains, palms, guava, ceibo, bungo and other trees. This is the process by which the whole of the delta has been formed, and is now forming. There are now to be seen the following new made lands:—First, Cancrejo Island, the paradise of crabs, and the residence of the pilots, which forms the outer barrier of the harbor. Outside of this, and lying between a channel deep enough for coasting vessels, is Sabanita, but little elevated above the water. Farther out is seen an island with only a few mangles which have taken root, and this only within a few years. This is the home at nightfall of sea-birds. Still further is a long, low flat, visible at low water, and further out the lead and line reveal the "shifting bar" and the area of shoal water.

If this interpretation of the formation of the delta be correct, it is easy to foresee what is to be the future of its growth, and how it will modify the present coast-line.

Between the Boca Grande and the most northern of the mouths of the Orinoco, the Manamo, there are thirteen other mouths, four of which open into the shallow gulf of Paria, and two others near it in the "Serpent's Mouth." Another mouth of the river, Barima, finds exit to the sea one degree of latitude further east than the Boca Grande, and southwards towards British Guayana. This is the only southern mouth. Outside of it lies the large Island of Barimas. This island is mainly due to the action of the northeast trade wind. Against the action of the trade wind blowing on this part of the coast, is the great tropical current caused by the trade winds blowing farther within the tropics. This current is the parent source of the Gulf Stream on our coast. It flows steadily on towards the island of Trinidad; arriving there, it divides, a portion going through the Serpent's Mouth into the Gulf of Paria, and through it into the Caribbean Sea, the other flowing around the island of Trinidad into the same sea. This northern current bears along with it much of the sediment of the Orinoco. Much of it goes through the Serpent's Mouth. Four mouths, as has been stated, open directly into the Gulf of Paria. In consequence of this double source of deposit, this gulf is gradually filling up—so rapidly, that the harbor of the Port of Spain is seriously damaged. Since warehouses were built on the shore line, the dock line and steamboat landing have been many rods removed, and the anchorage for landing vessels is now many cable-lengths outside in the harbor.

Some future observer there may find the "Serpent's Mouth," beginning at the southeastern cape of Trinidad, C. Galeota; the Gulf of Paria filled up by the sediment of the Orinoco, and the Island of Trinidad within the delta. Such is the powerful action of rivers; and so weak is Ocean to resist.

## The Other Side—The Slate Interest.

BETHLEHEM, PA., March 8, 1869.

EDITOR JOURNAL OF MINING.

SIR:—Your paper, dated Feb. 27th, contains a statement made by correspondent "N." giving statistics of slate supply in various parts of the West, and winds up the article by a quotation from an Allentown, Pa., paper.

The article was penned in order to influence the price of slate, it is very evident, and is not new to us in the Northampton Slate District. We have had several replies to it in our local newspapers, and the editors who have republished it have confessed that they "misinformed their readers," and apologized to them, promising not to be imposed upon again by persons who had very dull axes to grind.

I do not intend answering for Vermont, but simply for Lehigh and Northampton County, Pa. We live here and know that the supply or over-supply does not exist; in fact no stock is on hand, with the exception of that at the Chapman quarry, and that is not enough to meet the demand of two months, when the season once opens.

To be more pointed, the article in the Allentown paper, and another in the Bethlehem *Daily Times*, appeared immediately after the visit of a large New York buyer of slate had made the round of the quarries, and everywhere proclaimed the same story—"Prices too high, must come down—the stock on hand is too great," etc., etc. He desired, however, to make contracts for all the various quarries could produce during the year, provided "prices were reduced."

With regard to the statement that the Chapman Company is "*the only one which pays dividends*"—that also is not so; but if such were the fact, that could be explained by stating that the Chapman Quarry has been worked about 18 years and has been greatly developed, while some of the newer openings are not yet in a condition to pay, as they are nearly all a part of working capital, and their profits are used in building up the interests of the various companies, in purchasing machinery, building houses, extending the quarries, etc., etc. The time will come, however, when all companies based on a good slate formation and economical management, will pay largely. Such is the opinion of those who hold stock therein. Those based on speculative foundations with no large slate supply, or no favorable formation, cannot be expected to become paying enterprises.

With regard to the vast over-supply in the West, I am not able to judge whether true or not, but deem that assertion overdrawn and for this reason:—Parties from Chicago have but lately purchased heavily for that market in our district. Another party desiring 3,000 squares, and another 5,000 squares for the Pacific Railroad, have been here to purchase. It does not seem probable that if the supply were so great in the West that purchasers would come here to add to their already overstocked market. Not likely.

TRUTH

☞ A new electrical machine, devised by Mr. Carre, is said to give very remarkable results, with a small surface of friction. Above and parallel to the disc of glass, which turns slowly between two cushions, is another disc, of non-conducting material, which acts by induction—the lower glass disc being the inductor.

☞ Fifty-four companies, to mine in the new White Pine Mining Regions, have been incorporated in San Francisco, with nominal capitals aggregating sixty-two millions. The Board of Brokers of San Francisco is considering the propriety of adopting more stringent rules regulating the admission of new stocks.

☞ The mineral products of Great Britain and Ireland in 186 were valued at £43,480,092, or $217,000,000 in gold.

# Original Papers.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

## THE CHEMICAL OPERATIONS—X.

BY PROF. G. HINRICHS, OF THE IOWA STATE UNIVERSITY.

### 15. FLUXING.

79. Quartz is a very common mineral. When finely crystallized in six-sided prisms and pyramids, it is called rock crystal. Ordinary sand is quartz, pulverized by natural agencies. This substance is totally infusible in our furnaces or gas-flames; and it is moreover insoluble, not only in water, but also in almost all solvents. There are many other insoluble and infusible substances, and the chemical analysis or examination of them requires special methods, since it is in general necessary for the chemical investigation of any substance to reduce it to liquid form, either by fusion or by solution.

If finely-pulverized quartz (or sand) is intimately mixed with three or four times its weight of pure potash or soda, and the mixture is exposed to white heat, a fusion of the whole mass takes place, and the fused mass, after it has solidified by cooling, is found to be soluble in water. A process like this, by means of which an infusible or insoluble substance, being heated with another substance (called the *flux*) is both fused and converted into a soluble mass, is called *fluxing*.

80. Very small quantities (of quartz, for instance), are readily fluxed on the platinum wire. A bead of soda is first formed in the platinum loop. The soda-bead becomes, upon cooling, opaque, not transparent like the borax-bead. By repeatedly dipping the hot bead into pulverized quartz, successive additions of quartz are made to the soda; they are fluxed and fused, and in this way at last a bead is obtained which remains clear and transparent upon cooling, and is easily soluble in water.

Such processes are of the utmost value, both in chemical science and in the chemical arts. Thus, by fusing a mixture of quartz, soda and marble, window glass is manufactured. In metallurgy, slags are formed in the same manner.

### 16. VOLATILIZATION.

81. Heat a small quantity of sal ammoniac on the platinum foil; it will quickly *volatilize*, forming a dense white smoke. Common salt, heated in the same way, will remain on the foil. Hence, it is said, sal ammoniac is very volatile; common salt is not volatile. But here, as well as with regard to the solubility of substances, this use of language only expresses the extremes of a continuous series; for, upon closer investigation, it is found that *all substances are volatile*, if they are only exposed for a long enough time to a sufficiently high degree of temperature. The difference among bodies with regard to volatility is one of degree, not kind.

82. R. BUNSEN has made (1866) careful determinations of the volatility of certain salts by means of his gas-burner.* He volatilized the same weight (one centigramme) of each substance in exactly the same zone of the gas flame, and hence at exactly the same temperature, and noted the number of seconds required for the operation. He found that one centigramme of the substance volatilized as follows:

| | |
|---|---|
| Common salt, in | 84.5 seconds. |
| Glauber salt (anhydrons) in | 1267.0 seconds. |
| Potassium sulphate in | 665.0 seconds. |
| Soda in | 632.0 seconds. |
| Potash in | 272.0 seconds. |

83. The volatility is the greater the shorter the time required to volatilize a given quantity at a given temperature. If we, with BUNSEN, place the volatility of common salt at 100, we shall obtain the specific volatility of all other substances by dividing their time into that of common salt. In this way we transform the foregoing table of observed times of volatilization into the following table of specific volatilities:

| *Substance.* | *Specific Volatility.* |
|---|---|
| Common salt | 100 |
| Potash | 31 |
| Soda | 13 |
| Potassium sulphate | 12 |
| Glauber salt (anhydrons) | 7 |

All these substances are usually considered non-volatile, and practically that view is correct enough; but scientifically they are volatile, and possess very distinctly marked differences of volatility.

That even metals are volatile enough to be distilled, has been shown in § 51 (distillation of zinc.) Silver has also been distilled, by means of the ox-hydrogen blow-pipe, in a vessel made of burnt lime.

84. The volatility of liquids might be determined in the same manner, by observing their rate of actual volatilization; but it is also indicated by their boiling points. The more volatile a liquid is, the lower is the temperature at which it will begin to boil.

* For a detailed account of Prof. BUNSEN's experiments, see his *Gas Flame Reactions*, JOURNAL OF MINING.

Under the pressure of one atmosphere (760 mm.) the following well-known liquids boil at the temperatures indicated:

| *Substances.* | *Degrees, Centigrade.* |
|---|---|
| Mercury | 350 |
| Sulphuric acid (concentrated) | 325 |
| Linseed oil | 316 |
| Sulphur | 316 |
| Oil of turpentine | 293 |
| Phosphorus | 290 |
| Iodine | 175 |
| Tin chloride | 120 |
| Water | 100 |
| Nitric acid (of sp. gr. 1.522) | 86 |
| Benzine | 80 |
| Alcohol | 78.4 |
| Wood spirits | 65.5 |
| Ether (sulphuric) | 34.9 |
| Aldehyde | 20.8 |

Thus water is much more volatile than linseed oil or mercury, but much less volatile than alcohol, which in turn is much less volatile than ether.

### Wrought Iron Sleepers.

The *Newcastle* (Eng.) *Journal* has the following:—We are informed that a novel application of iron as a substitute for wood is being introduced into this district, which, if successful—as there is every probability that it will be—is likely to consume large quantities of our North of England iron. Our English manufacturers are accustomed to complain keenly of the competition of their Belgian *confreres*, but we are indebted for an invention which is likely to benefit our iron trade in no small degree, to a Belgian manufacturer who has worked it on the Continent for some years past with the utmost success. Any one at all conversant with colliery management is aware that whole ship loads of timber are consumed in supplying sleepers for the various underground and above ground railways in connection with coal pits. By the invention referred to, it is proposed to have, instead of a wooden sleeper with cast iron chair, a sleeper and chairs in one piece of wrought iron made in a tough-shaped section. It has been found, from an experience of some years in the French, Belgian, and German collieries, that this wrought-iron sleeper, from its superior endurance, is much cheaper than the wooden sleeper in the long-run. The mathematical accuracy and the rigidity of the wrought-iron way prevents the very great wear and tear and destruction of property, which often result from chairs being loose or broken, or from the easy fracture of the ordinary wooden sleeper. In the Continental coal fields, thousands of tons of these iron sleepers are now in use. It is not too much to anticipate, therefore, that our enormously extended coal trade will entail a ten-fold demand for them in England, Scotland and Wales, for surely nothing is deserving of greater encouragement, in an iron-producing country, than any invention which has for its object the economical substitution of iron for wood. We are informed that Messrs. George Hopper & Son, of the Britannia Iron Works, near Fence Houses, who have obtained from the patentee the exclusive right of manufacturing these sleepers in the United Kingdom, have already received trial orders for them from nearly every principal colliery in the great northern coal field.

# Ondit about Minerals; &c.

☞ Five passengers from White Pine arrived in San Francisco recently, each the fortunate possessor of about $100,000, the proceeds of their season's operations in the newly discovered silverado. Three of the number had grown rich by selling the proprietorship, or shares, in well known mines, and the two others by selling and by the proceeds of mines, in which they still hold considerable interests. Of the two last mentioned, the following story is related: They served through the war in the same company—one as captain the other as private—took part together in numerous battles, and escaped unscathed from the enemy's fire. After being honorably discharged they came to California, and the former private found his way to White Pine, and became an owner in one of the richest discoveries made in Treasure Hill. He wrote to his former captain to join him, and on the arrival of his comrade he made over to him one half of the mining property. The two are now wealthy beyond their most sanguine expectations.

☞ The coal dealers in London are obliged to have their wagons so made that each of them is, in effect, a weighing machine. By the use of a lever near the wheel, the load of coal is placed upon the scale and the true weight immediately and easily ascertained.

☞ A vein of quicksilver has been discovered in Solano Co., California, seven miles from Vallejo.

# Scientific Brevities.

☞ Staircases, whether of wood or stone, will wear out; but a remedy has been found by M. Cazeau, who says he has found a durable covering in thin plates of aluminum bronze. He proposes to try his covering on the column of the Place Vendome; and reports that the experiment has been made in a factory, where plates of common bronze on the stairs one half inch thick were worn out in six weeks, while plates of aluminum bronze one-eighth inches thick remain just the same as when new, after eleven months of service. Aluminum bronze is not too expensive if it will bear this amount of usage. It is merely copper, with from eight to ten per cent. of aluminum.

# Special Notices.

### Railroad Iron for Mines.

The attention of superintendents of mines and others is directed to the advertisement of Messrs. DANAS & LITCHFIELD, upon the last page of this week's JOURNAL OF MINING. The DANAS of this firm are the brothers F. & F. A. DANA, who have been favorably known in connection with railroad iron for mines for several years past. In fact, they have made the business a speciality. The recent addition of Mr. LITCHFIELD to the firm tends to extend their business connections. It will be noticed in the advertisement that they offer, as heretofore, to supply railroad iron for mines in lots to suit purchasers, also chairs, spikes and fish joints.


OFFICE OF

The Bishop Gutta Percha Company,

113 LIBERTY ST., N. Y.

# BISHOP'S

## IMPROVED ELECTRIC

## FUSE.

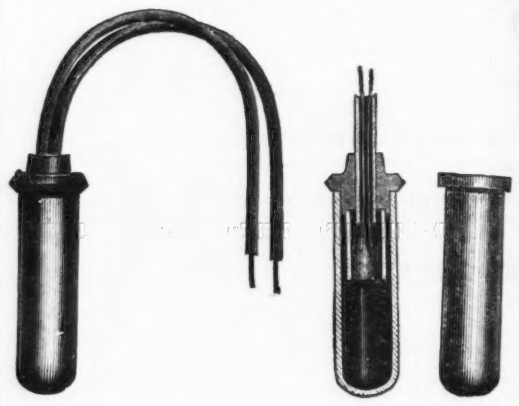

FIG. 1. FIG. 2. FIG. 3.

The accompanying cut represents the Fuse, which can be used for the explosion of

Powder or Nitro-Glycerine.

The two Conducting Wires (3 1-2 feet long are each separately insulated and tested before using. This mode has been adopted as the best and surest one, and most reliable, as the insulation

**Can be Thoroughly Tested in Single Wire,**

and CANNOT BE where two wires are insulated in one covering.

———:o:———

FIG. 1 is a perspective view, and Fig. 2 a vertical section, showing the internal construction. Fig. 3, shown in the accompanying cut, is to be used with

## Match Fuse,

for blasting with Nitro-Glycerine; the Fulminate is the same as used in No. 1, and is

SURE FIRE.

We offer to the public this IMPROVED FUSE for Blasting Powder or Nitro-Glycerine. The Primer and Fulminate is prepared by

DR. J. G. POHLE,

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The manufacture of the Fuse is under the charge of

**CHARLES A. BROWNE,**

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**PURE COPPER**

AND

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to use with this Fuse, of an entirely new and much improved pattern, from a design by Mr. BROWNE, which we feel sure will please, and be sold at very much less than the present Machine in use.

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The Fuse will be packed in Boxes of 100 and 1,000 each, and in this manner will be sold, ready for shipment. Prices will be graded by quantities wanted, and will be as low as the same quality of Fuse can be had in Market.

———:o:———

For any further information, and Pamphlet with full instructions, apply to

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Feb. 1-1-y-

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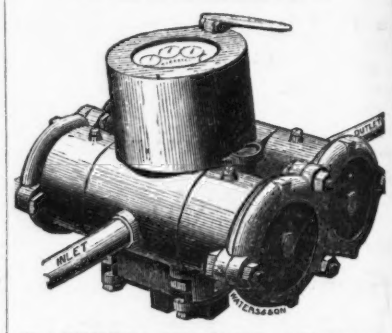


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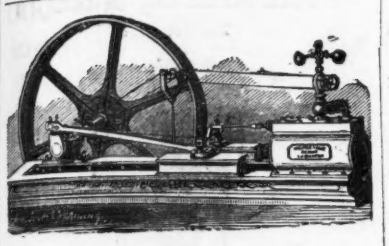

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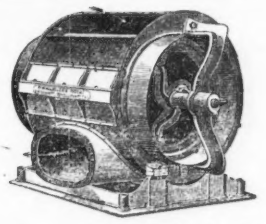

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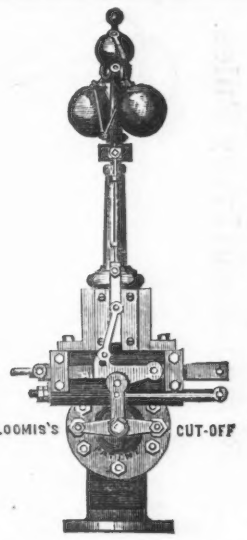


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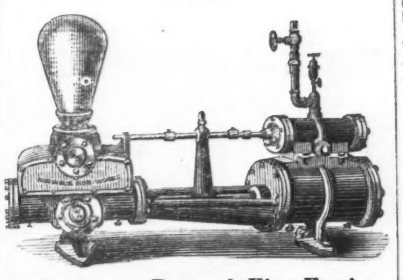

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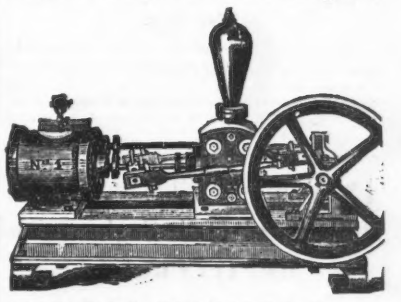

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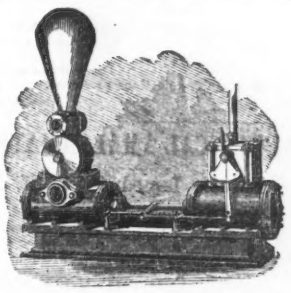

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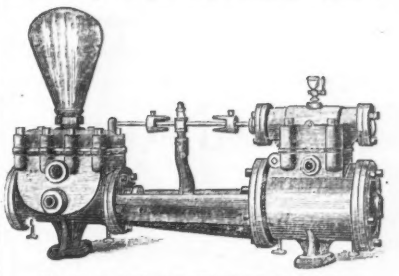

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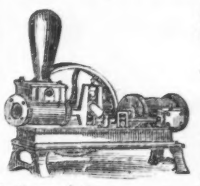

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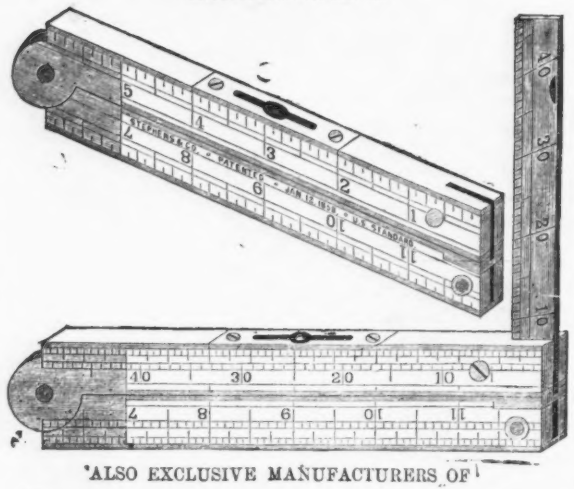

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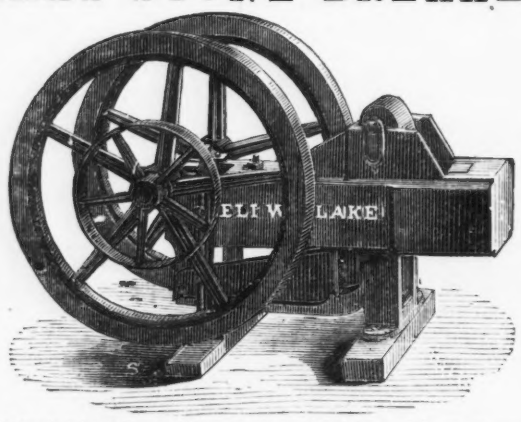


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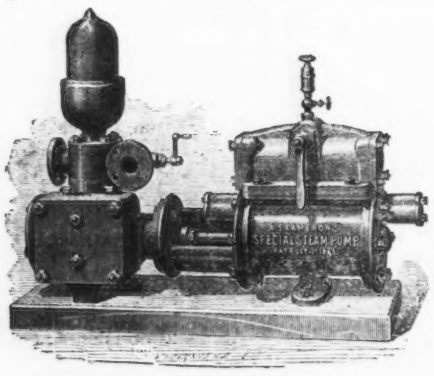


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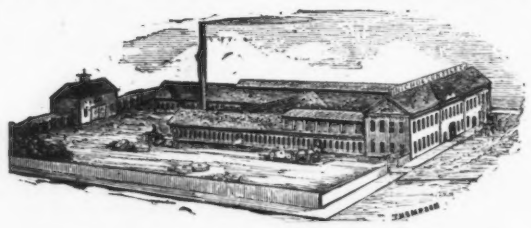

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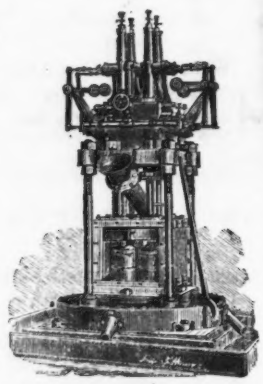

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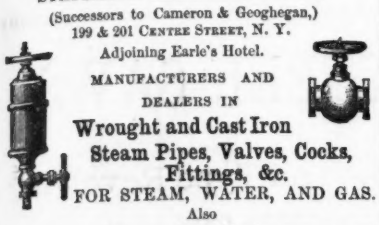

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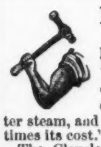

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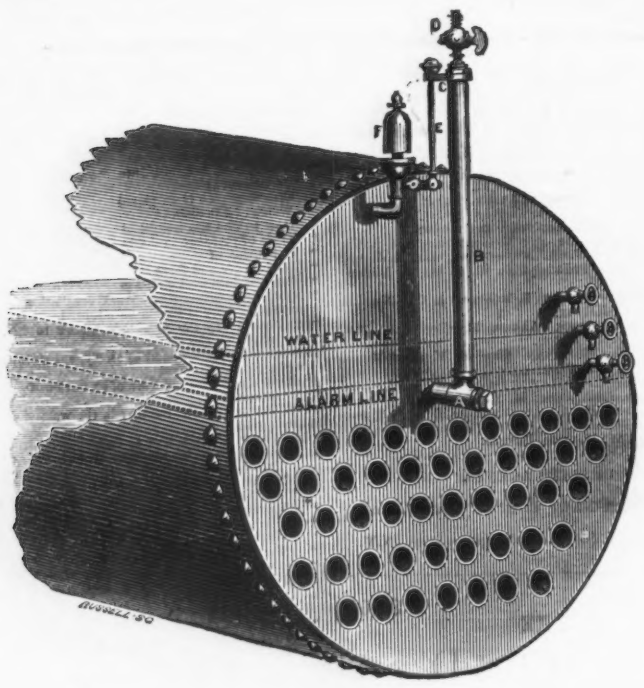



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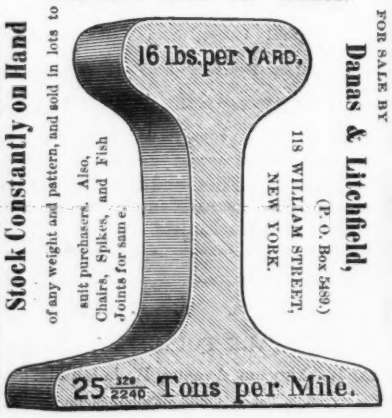


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